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PRESENTED BY

AN ACCOUNT
OF THE
ELECTIVE COURSES

GIVEN AT
HARVARD COLLEGE.

PUBLISHED BY THE
EDITORS OF THE HARVARD DAILY ECHO.
1881.

Edson L. Whitney
53t. Charles St.
Boston Mass

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In preparing the following descriptions of courses in Harvard, care has been taken to consult the various instructors, and to benefit by the experience of those students who have taken the courses. It is believed that this attempt to supplement the College Elective Pamphlet by more detailed descriptions will be found useful in selecting courses for next year. As a considerable portion of this was written early in the year, allowance must be made for changes in the numbering and arrangement of some of the electives. Owing to recent changes in several electives, and the late appearance of the Elective Pamphlet, much hasty revision has been necessary, and there are some alterations which may have been neglected. The index is ar-

ranged according to next year's pamphlet, so that there will be no difficulty in finding the courses, although the arrangement, owing to the method of printing, is hap-hazard. No description of Mathematics 8 is given, as the nature of the course varies from time to time, and it is uncertain whether it is given at all next year. We wish to express our thanks to the professors and students who have assisted in preparing these pages.

ELECTIVE PAMPHLET.

NATURAL HISTORY 1, 4 AND 8.

To the student who aims at attaining a practical knowledge of geology these three courses are indispensable. They are also well nigh indispensable to any man who looks forward to a life outside of city walls, or who values education as a key to a deeper enjoyment of the beautiful and useful in nature. These three popular electives form a logical series, the first designed to be taken in the Sophomore year, the second in the Junior, and the third in the Senior, by those who desire to carry out practical geology to a further extent. Natural History 1 may be taken as a two hour elective, in which case the lectures are on physical geography—the size, shape and density of the earth, oceans and their distribution, the character of the sea bottom, and the land and its features; or as a three hour course—the third hour being given up to meteorology, or the physics of the atmosphere,

including storm phenomena, weather probabilities, etc. No text book is required in either branch of this course, although Buchan's "Text Book of Meteorology" is recommended for use. The predominance of mathematical calculations in parts of Natural History 1 has rendered it to some minds too difficult for an elementary course. For this and other reasons it has lost somewhat of its popularity.

Natural History 4 is, on more accounts than one, the most popular of the series, and has generally the largest number of entries of any elective in College. This also may be taken as a two or three hour elective, the third hour being devoted to lectures enlarging on the more important parts mentioned in the other hours, and carrying out into particulars the work of those hours. This third hour, for part of the year at least, while the expeditions in N. H. 8 are possible, is conducted by Mr. Davis. In former years this time has been occupied in field work, but it has been found desirable that those who take field work should know beforehand something of what

they are going to see. Therefore all field work of a minute kind (all, that is, except the voluntary Saturday expeditions), is now confined to N. H. 8., for which course, the matter of these third hour lectures is a suitable introduction. The field work is voluntary, consisting of expeditions in the spring and fall to various quarries and other places of interest in the neighborhood (often trips by rail to Chelsea, Quincy, Princeton, etc.), and the time consumed in them is usually half a day on Saturdays. The text book used serves more as a table of contents to the lectures than anything else, and the lectures are invariably crowded with valuable and entertaining information. Following the general arrangement of topics in the text book (Dana's new "Manual of Geology") the nature of the earth's crust is first treated of, and mountain forms, dikes and veins, the stratification and fracturing of rocks, and kindred points, are explained. Then follow explanations of glacial, volcanic and earthquake action, of the erosive and up-heaving forces of the earth, and

of the formation of lakes, coal and peat deposits, and of coral reefs.

The latter part of the year is devoted to a compact review of modern information as to the history of geological ages. From the genesis of animal and plant species, the class is led forward from age to age to the appearance of prehistoric man, and then with a sketch of the wonderful part which man fills in the scale of life and development, the course closes with so many suggestions of unexplored fields of science, that the true student regrets the brevity of College life which cannot permit him in Chemistry, Mineralogy, Zoology, Botany and Palæontology, to trace them to their far-lying extremes. The price of Dana's book is \$4. In both Natural History 1 and Natural History 4 hour examinations are held, and the semi-annual in the third hour consists of an hour examination held some time before the semis begin, the regular semi covering only the two-hour part of the course.

The third in this series of electives is Natural History 8, less popular because localized and made more prac-

tical. This course has out-door as well as in-door work in it. It utilizes spare days in pleasant weather by filling them with extended trips to localities of geological interest, while in winter connected in-door work in reading on the topics taken up, requires a large amount of additional time. The lectures treat mainly of the fundamental theories of geology, such as evolution, time ratios, and the equilibrium and harmony of earth force. An opportunity is offered, though this is aside from the required work, for a general study of lithology, using the student's collection in the Museum. The course counts as a three-hour Elective, though only two of the hours are taken up by lectures, the third being filled by supplementary work and reading. It is only open to those who have already taken Natural History 4. Lyell's "Principles of Geology," 2 vols., is used, cost about \$7.00.

NATURAL HISTORY 3 AND 7.

Very few of the men that have not taken or do not take either of the electives in Botany, properly so called, have any idea of the opportunity for delightful study that they are allowing to slip by unimproved. Although Natural History 5 (Biology [Morphology, Histology and Development of Plants and Animals], three times a week, Professor Farlow and Dr. Faxon,) deals somewhat with cryptogamic botany, and takes up for a short time the examination of vegetable cells; yet, it cannot strictly speaking be called a course in Botany. The only true botanical courses for undergraduates are Natural History 3 (Gray's text-book. Lectures and laboratory work, three times a week, Professor Goodale), and Natural History 7 (lectures and laboratory work, three times a week, Professors Goodale and Farlow). In Natural History 3, the more elementary of the two courses, the general scheme of "Gray's Structural and Scientific Botany," is ad-

hered to ; but the subject is much more carefully elaborated than in Mr. Gray's book. The instruction given consists principally of lectures by Professor Goodale, supplemented by practical laboratory work in the lecture room and in the herbarium. The morphology and physiology of plants are in turn taken up. The plant is studied in its embryonic state, and is traced through its successive stages of development, from the time when it begins to germinate until it reaches maturity. A comprehensive study is made of about twenty of the more important order of plants ; so that a man may be enabled to place at sight any common plant that he chances to meet with.

The economic products of plants are studied with the aid of the economic collection in the Museum, which shows all the uses to which plants are put in the arts and manufactures. During the latter part of the year, systematic botany is studied, and frequent recourse is had to the garden to illustrate the systematic arrangement of plants. The analyses made during the year are for the

most part made under simple microscopes; although at times compound microscopes are used for the examination of the more intricate cellular structures. While the season permits, specimens for analysis are brought directly in from the garden, and during the winter, from the greenhouses. The herbarium contains one of the most complete collections in existence of native and exotic plants, and is the result of years of patient labor by Professors Gray, Goodale, Farlow, and many other well known botanists. The collection is much used for reference during laboratory work. The Museum has also a rich collection of diagrams for use as illustrations at lectures. In Natural History 3 there are two lectures a week; and about three hours laboratory work is required from each member of the elective. This course may be taken without the laboratory work, in which case it counts as a two-hour study, but such an omission is not considered advisable by the instructor. The text-books used are "Gray's Structural and Systematic Botany" and "Gray's Manual;" and each man is ex-

pected to supply himself with a pocket microscope and a scalpel. The total cost of text-books and instruments is about \$4.50.

Natural History 7 has for its primary object an exhaustive study of the Morphology of Vegetable Cells and Tissues. Much attention is given to Histology and Physiology. No special text-book is used, but frequent reference is made to works in the Botanical Library. Professor Goodale gives two lectures a week, and each man undertakes certain practical experiments, such as the growth of plants in different conditions of atmosphere, soil, etc. During the second half year a careful study of cryptograms is made, beginning with the Algæ. From seven to nine hours laboratory work is required. Polariscopes, spectrosopes, compound microscopes, and all the other accessions to laboratory work are provided. This course is of special importance for men that intend to study medicine, as it gives experience in practical dissection, and a knowledge of the anatomy of the lower forms of life.

NATURAL HISTORY — GRADUATE GEOLOGY.

There are, including the course in Palæontology, six graduate courses in Geology. These will be described in the order in which they are mentioned in the catalogue.

Graduate 39. Palæontology (twice a week, Prof. Shaler) is intended to give the advanced students of Geology and Zoology a knowledge of the extinct faunæ of the world. Each group of animals, beginning with the protozoa, is taken up in turn, and is exhaustively studied in reference not so much to species as to comparative tendency of development. Two lectures are given each week, and in addition students are expected to spend several hours in the examination of specimens and in drawing. The course is open to those only that have taken Natural History 2 or 5, and Natural History 4. The ability to read at sight scientific French and Ger-

man is essential. The text-book used is Nicholson's Palæontology.

Graduate 40. Historical Geology. Prof. Shaler; two hours a week; lectures, field and laboratory work. In this course the relations of the fossils to the various horizons are carefully studied, with the view of enabling the student to determine the age of fossiliferous rocks. Owing to the wide variation of the comparative values of the different species in determining rocks, an accurate acquaintance with zoology is required. The work done is almost entirely practical, each man taking a special group and working it up by himself. In the study of the fossils use is made of the various governmental reports. These are numerous, and in many cases comprise several volumes. The course is open to those only that have taken advanced Geology and Palæontology. No examinations are held, but the results of the year's work are presented in the form of theses.

Graduate 41. Geological field work, Professor Shaler and Mr. Davis, counts as a two hour study. The aim of the

course is to give special training in observation and description of geological phenomena. In fine weather students are expected to be in the field one day in a week, or an equivalent amount of time. Places in the vicinity of Cambridge are carefully studied, surveyed and mapped. Generally two men take a section of country of about twenty square miles area; and this they are required to prepare a map of, noting all the geological features, and to present a report thereon. They are also required to make collections of the rocks occurring in their section. A map is expected from each student, but a single report is considered sufficient for a region. Natural History 4 and 6 and Chemistry 2 or their equivalent are necessary for preparation, and some knowledge of topographical surveying is desirable.

Graduate 42. History of geological opinions, once a week, Prof. Shaler, is open to those only who have taken Natural History 4 and 8 and who can read French and German. This course is intended to give in two successive years

a review of the literature of Geology, as far as it deals with the more important hypotheses of the science. As a history of geological thought it is of great value to the specialist, while to the general student it is of interest as showing the mode of scientific thought in past times.

Graduate 43. Dynamical Geology, twice a week, Prof. Whitney, is, as the name indicates, devoted to the study of geological forces. The subject is considered from a practical point of view. The general arrangement of Part IV. Dana's "Manual of Geology" is followed.

Graduate 44. Economical Geology, twice a week, Prof. Whitney. About sixty lectures in the year, treating of the occurrence and distribution of useful minerals and rocks.

GREEK 2.

The first eight weeks of this course will be devoted to Greek Etymology. This word conveys to many men the idea of a dry, uninteresting study, perhaps calling to mind nothing but the early days of grammar, paradigms and woe. Every man is not aware that Etymology, as studied in this course, is a means of tracing the descent from a common origin of all the different races of Europe, and of some of those of western and southern Asia; and of learning as much as possible about the condition of that original father tribe which lived many centuries before the time of Homer. Besides their value and interest from a historical point of view, these lectures are of great service in the study of language. This study of Etymology shows how to trace the same word-root through the different languages (though Greek, Latin, and German, or English are the languages

mainly considered), and gives the laws governing the different forms that it will assume in each. It shows how to recognize roots in their various disguises. It gives the meanings of different prefixes and suffixes, thus helping to determine the meanings of derivatives, and enabling one to group together large numbers of words as derivatives of a single root. In fact the main object of this study is to enable the student to form a Greek vocabulary on scientific principles, instead of in a random, haphazard way. Its purpose is to give him rules which will enable him to find the meaning of words without constantly referring to the dictionary, and which will aid him in remembering their meaning when he has once ascertained them. The recitation hours of the first three weeks will be devoted to introductory lectures, describing the principles of Comparative Etymology. Up to the present time the instructor has used the eighteenth book of the Iliad in applying the principles of Etymology. After this year, however, he intends instead to make a list of about 1,000 or

1,500 of the commonest Greek words, and to have the members of the elective arrange them in groups about the roots from which they are derived. To the vocabularies thus formed it is intended that the student shall add other words as they occur in the course of his reading. The instructor's object in this will be not so much to put the student in possession of a large vocabulary (there would be no time for that), as to teach him the method of the scientific acquisition of such a vocabulary. After the first eight weeks the Sicilian expedition of Thucydides is taken up. The method of instruction employed in this part of the course is not to have men read such difficult Greek as Thucydides without previous explanation of the text. The instructor lectures, prefacing each lecture by questions as explained below, and when twenty or twenty-five pages have been considered, this is then translated to him in a single hour by the members of the elective. This reading of a large quantity in a short time, after proper explanation of the difficulties, is of great service in giving men practice

in reading fluently and elegantly. It may be mentioned, to show the success of this method, that, at a recent recitation, twenty-five men reading about twenty-five verses apiece, read six hundred and seventeen verses of Homer in less than an hour, the reading losing nothing in correctness on account of its rapidity. The regular work is arranged in the following manner: The men read about three pages before the recitation. At the beginning of the hour the instructor asks a few questions about the previous lecture. He then asks questions on the construction of the text upon which he is going to lecture. This plan does away with the necessity of hour examinations, and keeps the men up to their daily work. After this he lectures for the rest of the hour, giving opportunity for questions. The men read collaterally, at the rate of a page and a half a day, in another book of Thucydides. This year Classen's German edition is used; but by next year a translation of Classen's book, at which the instructor is working, will be ready. At the end of the year a play of Aris-

tophanes will be read at the rate of one hundred verses a lesson. The work of the course is so arranged that Thucydides, which is the most difficult part of it, will come during the cold weather. The cost of text books is small, not exceeding three dollars.

SPANISH I.

Spanish I. is intended to be at once an independent course, and an introduction to the more advanced Spanish electives. Its main object is to enable men, in a years' time, with reasonable diligence, to read any ordinary Spanish author understandingly and with satisfaction to themselves. To do this, the first requisite is a considerable vocabulary. As soon, therefore, as the more elementary grammatical difficulties are cleared away, translation is begun. The lessons are gradually increased in length, till a very considerable facility in translation is acquired. Great stress is laid on reading at sight. The text book is Gil Blas.

published by the Appletons at a cost of \$1. Subordinate to this main object, but still important, are the matters of composition and practice in speaking the language. The exercise in composition which occurs, on the average, about once a week, is the principal means of instruction in grammar, and is so conducted as to afford important aid in acquiring and using the long vocabulary of words which it is desirable to secure. In connection with the exercises in conversation, which are begun in the latter part of the year, use is made of a little book — “*El Eco de Madrid*,” (cost \$1.20), which contains the more common idiomatic phrases. The dictionary employed is *Seoanes Neuman and Baretti’s*, edited by *Velasquez*. Like all Spanish-English dictionaries, it leaves much to be desired, but it is, on the whole, the best. In the larger edition it costs about \$5. There is a smaller edition of the work for \$1.25, but men who intend to make a future use of Spanish are advised to procure the larger book. The grammar used is *Sales*, at a cost of \$1.50. The book, although antiquated,

is superior to the other English-Spanish grammars, in that but little that it gives must be afterwards unlearned. The rule which forbids this course to men taking Italian I. is inflexible, and is the result of experience. The two languages are so very similar, that even when taken at different stages, it is almost impossible to avoid confounding the two, especially in the work of composition. The exceptional case of a very clear head, and a special aptitude for languages, only reduces this confusion to a minimum. Beginning both in the same year, would render it simply hopeless. The study of Spanish commends itself, not only from its historic interests, its rich literature, and its intrinsic beauty, but from the fact that it may often be practically useful to men of business in view of the many Spanish-speaking peoples with whom we have commercial relations.

GREEK 4.

This course, which is generally taken by about sixty men, is divided into two sections, one of them reciting Mondays at three P. M., and the other on Fridays at the same hour. During the first third of the term, most of the time is given to translation from English into Greek. Sidgwick's Greek Composition is used, one exercise being required weekly. The hardest part of the year's work comes at this time, the work required being rather more than would ordinarily be required for a one-hour course. This extra work is regarded as part of the extra work required of candidates for second year honors. After Christmas the work is lighter. The written exercise is required once every two weeks, the hour of the intervening week being devoted to reviewing corrected exercises, and to doing written translations at sight. Moreover, at odd

times there is oral translation at sight. The text book used in translating is "Passages for Translation at Sight," by James S. Reid. Part II. Greek. This book contains short selections from all the best Greek writers.

The method with regard to the Greek exercises, is to return the corrected exercises of each week at the next recitation, and to give with each a slip on which is printed the exercise as translated by the instructor. Throughout the year constant reference is made to Sidgwick's notes on constructions, especially to his notes on Idioms. One of the many merits of this book is that it makes Greek Composition not only interesting, but at times even funny. This course is designed especially to prepare men for taking second year honors, and is conducted entirely with reference to this end. The semi-annual examination counts like any ordinary examination, simply with reference to a degree; but the annual examination, held at the end of the year, counts also as a special examination for second year honors. The cost of the books in this elective is

\$1.60 for "Sidgwick's Prose Composition," and \$1.00 for "Reid's Greek at Sight."

FRENCH.

French is, perhaps, the only study in which all the courses given at Harvard are arranged upon a definite system. Beginning with Freshman Prescribed French, the courses form an evenly graded scale, each a year more advanced than the course below it, up to French 4. A beginner, in order to acquire a thorough knowledge of the language, ought to take the French courses in seven consecutive years. The courses are all conducted on much the same plan. The instruction is given in French, and students are advised to do the outside reading as much as possible without the help of a dictionary. Students are required to find out themselves what they do not know, and to seek information on those points at the instructor's hands.

French 5 (twice a week, Mr. Bendelari), is, properly speaking, a course

in history, and as such it will be considered in its turn.

Freshman Prescribed French, (Fenelon's "Fables," Voltaire, ["Histoire de Charles XII."] Modern Novels, Brochet ["Petite Grammaire Francaise"], three times a week, Assistant Prof. Jacquinet,) is intended for men that have never studied French. During the first part of the year one of Fenelon's fables is committed to memory for each recitation. One man recites this while the rest of the elective write it. After the first few weeks the instruction is given entirely in French. Voltaire's "Histoire de Charles XII.," and some modern work, such as "Le Clos Pommier," are read. At first the books read are translated in the class, but after the students have gained a certain facility in reading French, they are not required to translate, but to underscore all the words they do not understand, and to come to the instructor for explanation. Brochet's "Petite Grammaire Francaise" is studied for the purpose of becoming familiar with the

more elementary principles of the language.

French 1. (E. About, G. Sand, French plays, exercises, conversation and composition. Three times a week. Assistant Prof. Jacquinot.) In order to give the students facility in speaking and writing French, some easy modern work, such as Alfred de Musset's "Merle Blanc," is memorized, ten to twenty lines at a time, and recited or written in class during the first four weeks. During the second period a French novel is read. All doubtful or strange points are explained in full by the instructor. Third period: Translation at sight, conversation, composition. Before the end of the year the amount read at sight at each recitation usually reaches twenty pages or over. A man that works faithfully in French 1 is able at the end of the year to read any modern French prose.

French 2 (La Fontaine, Racine, Taine, Alfred de Musset, grammar and composition, three times a week, Professor Bocher,) is for those that have already acquired some facility in

reading French. The system of instruction differs little from that of the preceding courses. La Fontaine's fables are committed to memory, very little translation is done, but all difficult passages are explained in the class. Advanced grammar is studied, and students are required to write out the plots of the fables they have learned.

French 3. (Moliere, Corneille, Montaigne, Gidel [*"Litterature Francaise"*], grammar, composition, and lectures. Three times a week. Prof. Bocher). From fifteen to twenty lines a day are memorized. This gives a vocabulary, and a knowledge of forms that could in no other way be obtained. In addition to the reading required for examination, a number of plays are given out as extra outside reading, which the student is advised to read. The Saturday's hour is devoted to a lecture on the French language and literature. In this course theses in French may be substituted for Senior and Junior forensics. French 3 may be taken as a two-hour course by omitting the Saturday lecture.

French 4 (“Litterature Francaise,” themes, lectures, three times a week, Assistant Prof. Jacquinot,) is for those only that already speak and understand French with ease. The instruction given is wholly in French. The course embraces in three consecutive years the literature of the seventeenth, eighteenth and nineteenth centuries. During 1881–82 the literature of the eighteenth century will be considered. French 4 may be taken as a two-hour course by omitting the lecture on Saturday; but most men prefer to take the full number of hours. The Monday hour is devoted to the authors of the epoch. From twenty-five to forty pages are gone over. The instructor answers questions and explains difficult points. The second lesson, Thursday, has for its basis the history of French literature. Each student is required to prepare a chapter of about twenty pages, and write a theme on it. The themes are examined by the instructor and returned with criticism. The Saturday hour is devoted to a lecture on French literature. It is probable that the lectures during ’81–’82 will

be on Voltaire's "Litterature Francaise au 18eme Cicle." No preparation is required for the lectures; but copious notes are taken, and these are afterwards elaborated and completed with the assistance of reserved books in the library. In addition, from five to seven themes are written in English during the year on comparisons between standard French works and works in the dead languages or in English,—as, for example, the *Phedre* of Racine and the *Hippolytus* of Euripides. French 4, as a history of French literature, might be taken with advantage by a Frenchman. It is to be hoped that before long a course will be given on the literature of the sixteenth century.

NATURAL HISTORY 2, 5, 6.

Natural History 2 is meant to give general information to men that wish merely an outline sketch of the more

important facts and theories of zoology, while Natural History 5 is a course of practical laboratory study, backed by lectures, and is intended for those that mean to follow out a special interest in natural history or in medicine. Natural History 6 is a course in advanced zoology.

Natural History 2, zoology, *twice a week*, Dr. Mark. The instruction given is almost entirely in the form of lectures. Portions of some of the lecture hours are devoted to questioning on preceding lectures; but no lessons are assigned. Huxley's "Elementary Physiology" (\$1.20), is used, more as a book of reference than as a text-book. Lectures are given on the anatomy and physiology of the different organs in man, comparing them with their homologs in the lower animals. The primary constituents of the animal body are considered; and the embryology of special organs, especially of the sense organs; the various stages of development shown in different animals; and the classification, relationship, and distribution of animals. Numerous dia-

grams and figures are shown ; also anatomical preparations and models, microscopic preparations, and preserved specimens. Practical dissections are made before the class by the instructor ; but no dissections are made by students. At the beginning of the hour Dr. Mark writes a synopsis of the lecture on the board. This is of great assistance to the student. Two or three hour examinations are held during the year besides the regular midyear and annual examinations. Natural History 2 was given for the first time in 1879-80, and changes in the scope of the course and system of instruction will, from time to time, be made. In 1880-81 the scope of the course was as follows : statement in regard to animal structures, cells, organs ; general view of the animal kingdom, main groups of invertebrates ; functions — muscle, skeleton ; nervous system ; nutrition ; circulation ; respiration ; secretion ; reproduction. 2nd-half year : subdivision of the different groups of animals ; habits of animals ; commercial interests.

Natural History 5. (Biology, Morphology, Histology, and Development of Plants and Animals.) *Three times a week.* Prof. Farlow and Dr. Faxon. Prof. Farlow has the course for the first half year. With the aid of the compound microscope the different orders of plants are studied, beginning with the lowest, the protophytes, and ending with the phanerogams. The work done is principally microscopic. The student is expected to make drawings of what he sees, and is taught how to preserve specimens. In the lecture a review is made of the laboratory work done during the week, and points not touched upon in the laboratory are considered. The second half year is devoted to zoology. Systematic dissections, under Dr. Faxon, are made in the laboratory, supplemented by lectures on the histology, embryology and development of animals. One or more forms of each great group of the invertebrates is studied, viz., hydra, lobster, clam and starfish. Two or more hour examinations are held during the year. No text book is used; seven hours a week are required, six

hours in the laboratory and one hour lecture. The work given out permits of little or no cutting. The greatest defect in the course so far has been insufficient supervision of the laboratory work. As the number of students that take Natural History 5 is necessarily limited, preference is given to those that intend to take 6 or 7, or to study medicine. While Natural History 5 is an interesting and essential course for those that make natural history an important aim, it is in no sense a popular course, nor is it to be recommended for those with whom this science is a side issue.

Natural History 6. (Advanced Zoology. *Thres times a week*. Dr. Faxon.) Differs each year. One special form (in 80-81 it was the frog) is studied thoroughly in the laboratory. This form is the basis from which to make a comparative study of the vertebrates, including man. During the latter part of the year some group of the invertebrates is taken up. Nine hours a week are required, out of which one hour and sometimes two are taken for lectures. No text book is necessary, but students are

advised to procure a biological atlas (\$2.50) and Flower's "Osteology of the Mammalia" (\$2.50.)

NATURAL HISTORY—EMBRYOLOGY.

Graduate 32. Embryology. *Once a week.* Dr. Mark. This course is intended to furnish special and advanced students with a practical introduction to the study of comparative embryology. It has for its scope :

1st. A theoretical knowledge of the embryology of the main groups of the animal kingdom.

2d. A practical knowledge of the early stages of development, including the changes that precede cleavage, and the processes of segmentation and gastrulation.

3d. A practical knowledge of the subsequent stages in the development of one or more animals. (This varies for individual students.) The instruction

given consists in lectures and practical work in the laboratory under supervision. One hour a week, on Monday morning, is devoted to a lecture, and the student is expected to be in the laboratory at least three hours a week, and also it is necessary to drop in from time to time to shift specimens from one solution to another. In the first lectures the general nature of the sexual products is considered; next the origin of these products in the various groups of animals; and lastly the development of the embryo is carefully traced. The laboratory work consists in the study of the embryo of some of the commoner vertebrates and invertebrates, in fact of whatever embryos can be conveniently obtained. The work is principally microscopic. The reagents are provided by the College, but the student is required to furnish his instruments. The ordinary outfit of a microscopist's table is necessary, a zoologist's set of dissecting instruments, and a good compound microscope. It is desirable, although not absolutely indispensable, that the student possess Balfour's "Comparative

Embryology" (\$4.50). The accommodations are limited to six students. This course is counted by the Faculty as only one hour, although in order to do the work satisfactorily one must spend at least six hours a week, and much more time could with advantage be devoted to it.

NATURAL HISTORY—ENTOMOLOGY.

Graduate 33. *Twice a week.* Prof. Hagen. For the sake of convenience this course may be divided into two parts, lectures and laboratory practice. The lectures treat of insects generally. First, the grosser structure of the insect is described, and then the various systems and divisions of the body. The lectures are not confined to the anatomical structure alone, but the histological structure as well is considered. In addition, the various theories of the homologies and modes of evolution are studied. This course takes

up the subject from a point of view entirely new to the student, and the lecturer endeavors to give more advanced ideas than are taught in the undergraduate zoological courses. Hence it is not advisable for a man to choose this elective until he has acquired familiarity with the work of the more elementary courses in zoology. The lectures are illustrated by a sufficient number of prepared specimens; but care is taken not to create confusion by placing too much on the table at once. All the more important works referring to the subject of any lecture are arranged upon a table with the plans marked, so that after the lecture a man can look up any point he may desire. By this means the student becomes conversant with the literature of the subject, and is provided with material to think over at his leisure. In the laboratory the best methods of dissecting insects and of preparing specimens for the microscope are taught. The student is required to provide his own instruments. Some needles, scalpels, scissors and a good hand lens are necessary. No text books are required.

It is almost superfluous to say that Graduate 33 is a course of great interest as well as value to the student of natural history.

HISTORY 1, 5 AND 6.

History 1. (Mediaeval and Modern—chiefly of Germany, Italy and Spain.) *Twice a week.* Dr: Emerton. In this course the history of Germany down to the end of the thirty years' war and that of Italy down to about 1800 are taken up. It is an introductory course, and is intended to acquaint the student with the bare facts of the history of those two countries. The student is held accountable for everything in the text-books, but in the recitation room the instructor does not confine himself entirely to the book. There are no hour examinations. The text-books are Lewis' "History of Germany" and Hunt's "History of Italy,"

and both together cost about three dollars.

History 5 and 6. *Three times a week.*
 Dr. Emerton. These courses alternate with each other, and taken together cover the history of continental Europe from the year 800 to 1550, or, in other words, from the coronation of Charlemagne to about the time of the edict of Restitution. In 1881-'82 History 6, which begins at the year 1300, will be given.

At the beginning of the year each student must provide himself with a syllabus, which contains the topics to be considered during the year. Besides these topics it contains a list of the most reliable authorities for the period. These authorities are in German, French and Latin for the most part, although a number of them are in English. For each recitation the instructor gives out a few topics to be looked up. A great many of the hours are also given up to lectures on the prevailing institutions and customs of the time. For instance, this year, in History 5, the feudal system has been explained in detail.

Besides the regular work for the class each student is required to write two theses, from twenty to sixty pages of theme paper in length. He is expected to go to the original sources and get the most reliable information he can about his subject. The first thesis is due two weeks before the semi-annual examinations, and the second one two weeks before the annuals.

The object of the instructor is to go beneath the surface and examine into the under-currents which are constantly at work. He also aims to break the student of the habit of trusting blindly to whatever statements some unreliable English historian may make. He wishes him to go to the source himself and find out the truth. To take these courses a knowledge of German and French is very desirable, though not absolutely indispensable. As there is no fixed text-book it cannot be stated exactly what the expense will be. However, it is advisable to obtain the student histories of the period, which cost about one dollar and seventy-five cents apiece. But by free use of the library no books at all need

be purchased. There are only two examinations — the mid-year and the annual.

HISTORY 2 AND 3.

History 2. (Mediaeval and Modern History, chiefly of France and England.) *Twice a week.* Mr. Macvane. This course is intended partly for those students who wish to get an outline of French and English history without any intention of making history a special study; and partly as a preparation for the more advanced courses, especially History 7, 10 and 11. The history of France is carried down to about 1789, and the history of England to about 1760. In the recitations, or rather lectures, the instructor very carefully goes over the matter given out to be read for that day, explaining the meaning of such words as are unintelligible to an American reader, and describing at length the various customs and organizations which

are merely mentioned in the text books. The feudal system is explained, and all the laws and institutions of the Anglo-Saxons and French are described. A few references to the reserved books are made, and on the examination paper is generally one optional question embracing the subjects mentioned and referred to in the lecture. Two one-hour examinations will probably be given during the year. In the examination the student is held accountable for the narrative of political history as given in the "Students' History of France (price \$1.50) and the "Students' Hume," (Prof. Brewer's revision, price \$1.50,) with such explanations of constitutional and legal terms as are necessary for understanding the text, also for the historical geography of France and England,—divisions, chief towns, rivers, etc. No change is likely to be made in the general scope of the course for 1881-82. The course is new, and satisfactory books are hard to find. The books named above are used for the first time this year, and will be abandoned if better ones can be found.

History 3. (Constitutional Government in England and the United States. Introductory course.) *Twice a week.* Mr. Macvane. This course is intended partly for students who wish to obtain an elementary knowledge of “the two oldest constitutions in existence,”—partly also as a preparation for the study of English and American history in the advanced courses. No hour examinations are given, but a short thesis is required each half year. The recitation is carried on more as a lecture and conference, and no text books are required. Students, however, are expected to make use of reserved books, magazine articles, etc., at the Library. The present organization and practical working of the English and American systems of government is considered. The two systems are studied comparatively as far as possible. Probably no changes will be made in the course next year.

History 10 and 11 — *three times a week*—Mr. Macvane, together cover the history of Europe from the year 1600 down to about the present time. As

some of the greatest events in the world's history occurred during that period, the courses are both important and interesting. History 10 ends somewhere near the year 1725. History 11, beginning about 1750, comes down to about 1870, and is the course which will be given in 1881-2. No fixed lessons are given out, but at each recitation the instructor puts on the board a synopsis of events, and during the hour enlarges on them. Thus a connected history of the whole period is obtained. A liberal use of the alcove in the library is desirable, as there are many different books on the period which it is best to consult. There are usually two hour examinations in addition to the semi and annual. In English history next year the text book will probably be "May's Constitutional History." It is not certain what the other books will be, but the total expense probably will not exceed five dollars. In History 10 this year "Hallam's Constitutional History" and "Gardiner's Thirty Years' War" have been used.

GREEK.

Greek 3. The object of this course is to teach men to read with as little dependence upon the lexicon as possible. The method which the instructor intends to have pursued is as follows: At the beginning of the year, lessons of about two pages are assigned. The student in working upon this, first reads the lesson straight through without any help whatsoever. He then reads it through a second time, underlining the words that he does not know and making marks in the margin against the passages which he cannot make out. After this he settles his doubts, as far as possible, with the lexicon and his notes. At the beginning of the recitation the instructor occupies five or ten minutes in asking questions upon the vocabulary of the previous lesson. He then answers all questions on the lesson for the day, taking up one chapter after another, afterwards asking questions himself upon any

important points not already brought up. Sometimes there is translation. After about one-half of the hour has been taken up in this manner, the section reads ahead at sight for the remainder of the hour. The instructor's intention is not to get over the ground with the greatest possible speed, but to instruct the men in the proper method of translating at sight. A student is called upon to read at sight exactly as he would in getting out his lesson. When he goes wrong the mistake in his method is pointed out. The instructor, moreover, goes through the same process himself, reading from the text as if he were translating it for the first time. After the men have become moderately proficient in translating at sight they are allowed the greatest liberty in modifying the method, the object being not so much to fix an arbitrary method of translation as to overcome fundamental defects in the methods of individuals. The main object of the course is to give every man the habit of depending upon himself in translating to the fullest extent possible. The length of the lessons is gradually increased un-

til by the middle of the year the lessons are of six, seven or eight pages in length, about half of Herodotus being now read in the course of the year. Occasionally, during the year, one hour examinations are held. The greater part of all the examination papers is translation at sight. The edition of Herodotus which is used is Stein's. The notes of all five volumes of the original German edition are now being translated into English, and some of these volumes will be ready for use next year. There will ultimately be a sixth volume in the American edition consisting simply of the text. This elective will in time be made a three-hour course, when with the help of Mr. White's "Greek Word-Book," which is in preparation, it is hoped that Herodotus will be read through, from cover to cover, in a single year.

CHEMISTRY.

Chemistry 1 (Descriptive Chemistry—*three times a week*—Asst. Professor Jackson) is a course in descriptive chemistry. The primary object of this course is to give a general idea of the whole subject of chemistry, and of the position it occupies among the practical sciences of today. No natural science can properly be studied without some general knowledge of chemistry; such a general knowledge Chemistry 1 aims at giving. Another great object which the instructor keeps ever in view is to make the subject so simple and interesting to the general student as to induce him to take some of the higher courses. Lectures are given twice a week (Mondays and Fridays), and four hours a week laboratory work is required, either on Wednesdays and Fridays from 3 to 5, or on Tuesdays and Thursdays from 2 to 4. The lectures are upon the properties and reactions of the elementary substances, and their most familiar compounds. The more important reactions are practically illustrated by experiments

on the lecture table. The laboratory work consists in doing experiments in connection with the subject matter of the lectures. During the year the principal chemical processes used in the arts are considered, such as the extraction of metal from their ores, the manufacture of gun powder, Le Blanc's process, etc. Chemistry 1. is a course which while not essential would under any circumstances be of great assistance to a general education. If our government officials had studied this course we should not find one tariff for brimstone and another for sulphur. But at present those men who form the tariff are so ignorant of the most elementary principles of descriptive chemistry that the grossest errors are of frequent occurrence. An assessment of ten dollars is made upon each member of this course for reagents and use of apparatus. In addition to this the usual charge for breakage ranges from four to ten dollars.

Chemistry 2. Determinative Mineralogy and Lithology (with study in the mineral cabinet). *Three times a week.* Prof. Cooke and assistant. Chemistry

2 is a course in practical mineralogy and crystallography. Three lectures a week are given by the instructor, and the student can work in the laboratory whenever he chooses. The work done is arranged as follows: The first part of the year until Thanksgiving is occupied with the study of crystallography and the drawing of a few crystals. Wooden models of crystals, with all the commonly occurring modifications, are used for this study. After Thanksgiving come two or three lectures on blow-pipe analysis, and then the members of the course are furnished with bottles of substances to be analyzed by means of the blow-pipe. At the end of four weeks the study of the mineral species is taken up following the order of Dana's (small) "Mineralogy." After the lectures upon one group of minerals have been given, about a fortnight is allowed for the study of the members of that group before taking up the next group. The mid-year examination includes the first two groups, and consists in the determination of two or three crystals and some specimens from among the minerals that

have been studied. The work of the last half year is upon the remaining groups of minerals. The student is greatly aided in his work by having access to the mineral cabinet, which is probably the finest in America. There is a separate cabinet of specimens devoted to blow-pipe analysis. The annual examination is upon the work of the last half year. Hour examinations are occasionally held for the purpose of reviewing the work done. There is an assessment of five dollars upon every member of the elective for reagents and use of apparatus, and in addition the annual charge for breakage ranges from twenty-five cents to a dollar. Dana's (smaller) "Mineralogy" (\$2.75) is required.

Chemistry 3. Qualitative Analysis. *Three times a week.* Asst. Professor H. B. Hill. Chemistry 3 is intended to give all the instruction in qualitative analysis necessary to enable a man to make practical analyses. The course is counted as three hours, but those who take it are expected to spend at least nine hours a week in the lecture-room

or in the laboratory. It is presumed that the work of the elective can faithfully be performed in this time by a man of ordinary capacity—some men do it in much less, but on the average, nine hours is none too much to allow. The lectures are purely supplementary to the laboratory work; first as practical directions for doing that work, secondly to give the rationale of the processes necessary to be gone through. The lectures occur irregularly as they are needed to keep the class in work. On Mondays, Wednesdays and Fridays, at 12 o'clock, the members of the elective are expected to present themselves either at a lecture in Boylston 3 or for laboratory work in the upper laboratory. The remaining six hours consist entirely of laboratory work and may be taken at any time except at the regular hours assigned to Chemistry 1 for laboratory work. This exception is necessitated by the fact that, owing to the scarcity of desks, a large number of Chemistry 3 men are obliged to share their desks with Chemistry 1 men. The lectures are given by Professor Hill; the laboratory

work is superintended by Professor Hill and Mr. Mabery. In 1880-81 the first term was occupied in the separation of the bases, of which twenty-six were considered. After Christmas the acids were taken up, and twenty-three of the more important ones were considered. The mid-year examination, however, covered the bases alone. During the first-half of the year all the substances to be analyzed were given out in solution; during the last half year analysis in the dry way will be taken up, and all substances to be analyzed will be given out in the solid. As blow-pipe analysis is rarely sufficient, these substances will also have to be treated in solution; accordingly, the course will take up salts soluble in water, salts insoluble in water and soluble in acids, salts insoluble in water or in acids, which last will have to be treated by fusion. The course in 1881-82 will be substantially the same, but Mr. Hill hopes to be able to cover more ground than is done this year. The only text book required is "Notes on Qualitative Analysis" (75 cents), by Mr Hill.

“Thorpe’s Inorganic Chemistry” (\$3) is recommended. A regular charge of \$15 for reagents and use of apparatus is made upon every member of the course, and the bill for breakages is usually between \$6 and \$10. Chemistry 3 is open to those only who have already taken Chemistry 1.

Chemistry 4 (Quantitative Analysis [in the laboratory], *three times a week*, Professor Cooke and assistant) is a course for the purpose of teaching chemical analysis, and giving the student an idea of the manner of conducting chemical investigation. It also gives practice in doing work with neatness and with scientific accuracy. A very carefully arranged plan is followed including the various methods of analysis. The general order is as follows: Simple salts, volumetric analysis, analysis of alloys, rock analysis. Lectures are given once or twice a week upon the methods to be employed in the laboratory. No text books are used and the marks are upon the laboratory work. A certain percentage of the mark is generally “personal,” i. e., upon the manner

of doing the work irrespective of the result. The object of this is to induce the student to work carefully and neatly. The processes of quantitative analysis are naturally long, and consequently in order to do justice to the course one must spend a large part of his time in the laboratory. The laboratory is open all the time and the student may do his work whenever he pleases ; but he is expected to be in the laboratory from three to four on Mondays, Wednesdays and Fridays. An assessment of \$10 is made upon each member of the course for reagents and use of apparatus. The total expense of the course will be from \$15 to \$20, including charge for breakage.

Chemistry 5. (The carbon compounds—lectures and laboratory work—*three times a week*. Asst. Prof. H. B. Hill), is a course in organic chemistry desirable for those only who intend to make a special study of chemistry, either as a profession or with a view to teaching. This course might be well described in saying that it is Chemistry 1 applied to organic analysis. Three

lectures a week are given throughout the year, covering the entire ground of organic chemistry; but as the field is so extensive, the lectures can at best be but an outline, giving the most important formulæ and describing the most interesting processes. Thus they are chiefly upon theoretical chemistry, and they require much careful study. The members of the elective are supplied with copies of the lecture notes, as no text book is used. In the laboratory it is intended that the student shall get a general idea of the methods of conducting organic analysis and synthesis, since those processes differ entirely from inorganic analysis and synthesis. This work is upon the carbon compounds. No definite amount of laboratory work is required, and the examinations are upon the subject matter of the lectures. The remarks given are, however, upon the laboratory work as well as upon the work done at the examinations, and no one can obtain the maximum mark without spending some time in the laboratory. The best scholars generally do original work during the latter part of

the year. An assessment of ten dollars is made upon each member of the course for reagents and use of apparatus. In addition to this the usual charge for breakage ranges from seven to twelve dollars. Wöhler's "Grundriss der Organischen Chemie von Dr. Rudolph Filtig," (price \$5.50) is required as a work of reference. Chemistry 5 is open only to students who have taken Chemistry 3.

Chemistry 6. Advanced course in experimental chemistry (in the laboratory)—*three times a week*—Professor Cooke. This course is similar to the graduate courses. That is to say, the student does original work in the laboratory under the direction of Professor Cooke. The more accurate determination of atomic weights may be given as an example of the nature of the work done. At the end of the year the student writes a page upon his work, and if he adds new facts to science the paper may be published in the proceedings of the American Academy. Chemistry 6 is open only to students who have taken Chemistry 4.

Chemistry 7. Crystallography and the physics of crystals (with work in the mineral cabinet)—*three times a week*—Professor Cooke. This is an advanced course in crystallography. Three lectures a week are given following the plan laid down in Miller's Crystallography. Each member of the course is furnished with the lecture notes. The student is taught to measure and to determine crystals. A reflecting goniometer is used for this purpose, and the crystals are drawn by spherical projection. Some knowledge of trigonometry and spherical geometry is necessary. Chemistry 7 was first introduced in '79-80, and it is given on alternate years only.

HISTORY 8 AND 9.

History 8 and 9, *three times a week*, Mr. Snow. These two courses are devoted to the Constitutional and Political History of the United States down to the year 1860. This is a very important subject, about which every American ought to be fully informed. During that time the foundations of the two great political parties were laid and very many of the important questions of today were started then. A full knowledge, therefore, of the ground covered by these courses is very valuable to every one who wishes to be an intelligent citizen. In 1880-81, History 8, which last year came down to 1829, will be given. In this course, the history of the colonies, to the Declaration of Independence, is briefly touched upon. Then the articles of Confederation are taken up and their defects shown. The proceedings of the convention which adopted the Constitution are given in detail, and then begins the study of the

history of the United States as it is now under the Constitution. The Constitutional and Political History, both domestic and foreign, is gone into very exhaustively and includes some very important questions—such as the Tariff, the foundation of a National Bank, the Embargo, the Louisiana Purchase, State Rights and the Missouri Compromise. The foreign relations, also, during the first four or five administrations are very important, especially the causes which led up to the war of 1812, History 9 began this year with Jackson's first administration, and takes up the abolition of the National Bank, Nullification, the troubles with the Cherokee Indians, the Texas purchase,—in short, all the causes of the Rebellion. The course is conducted entirely by lectures, the instructor during the lecture giving full reference to his authorities. All these books are reserved in the Library, and, if a student writes up his own notes, he is obliged to use the reserved books to a great extent. Generally, some student writes out very full notes and has them printed for all those who

wish to buy them, charging enough for them to cover expenses. There is no book on the period which contains all that is needed. Most of the authorities are the lives and letters of the prominent men of the time. However, the book which every student is advised to get, and which may be called the textbook, is "Von Holst's Constitutional History of the United States." Volume 1 covers the ground for History 8, and Volume 2 for History 9. These books are quite expensive, costing about \$4 apiece. "Johnston's American Politics" is a very good outline of the period and may be used to advantage to get a general idea of the important questions. There are no hour examinations.

PHILOSOPHY.

Philosophy 1. (Laws of Thought and the Phenomena of Consciousness—lectures on Logic and Psychology—*twice a week*—Prof. Bowen.) This is distinctly an introductory course, and is considered a parallel course to Philosophy 2. The first part of the year is devoted to Bowen's "Logic," the second half to Mill's "Sir William Hamilton." The method of instruction is by recitations and lectures combined, and freedom in asking questions and discussions in the class room is desired. Besides the mid-year and annual, two or three hour examinations are held during the year. The cost of books is about \$5.

Philosophy 2. (Logic and Metaphysics. Jevon's Logic. Tenier's Lectures on Greek Philosophy. *Twice a week*. Asst.-Prof. Palmer.) This is distinctly an introductory course, and covers about the same ground as Philosophy 1. In the first half-year an outline of both deductive and inductive logic is given; in

the second, all the problems of metaphysics are proposed, though not solved. A history of Greek Philosophy is taken, not so much as a history of this philosophy, but because it shows the natural growth of philosophy in the mind of man. The method of instruction is by lectures in connection with the text books, which are used in order that the student may not depend entirely on the lectures. For the first ten minutes of each hour a question is given out for the students to write on. Though this is entirely voluntary, most of the class hand in papers at the end of the hour. This is intended to show how the class is studying, and to give them some practice in writing on the subjects they are considering. An hour examination is held in both Logic and Metaphysics. The mid-year examinations cover the whole of Logic; the final examination covers the work of the whole year, but is devoted chiefly to the work of the second half-year. The cost of text books is about \$4.50.

Philosophy 3. Elementary Psychology—*twice a week*—Prof. James. This

course will be materially different from the Philosophy 3 of 1880-81. It is Prof. James' belief that the course in Spencer has proved too hard for an elementary course. The course will differ, too, from the Philosophy 5 of this year, by the use of a simpler text-book (the translation of Taine on "Intelligence"), and more elementary lectures. There will be no thesis work, but probably hour examinations, besides the mid-year and annual.

Philosophy 4. (Ethics—*three times a week*—Dr. Peabody.) It is particularly difficult to give such a description of this course as may aid men in choosing their electives for next year. In the first place, the text-books, except one, have been frequently changed, and in the second place, the instructor who has conducted the course for many years past retires from his position in June. It is to be hoped, however, that his successor will make but few changes in the general plan of the elective. The text-book used in the first term is Peabody's Moral Philosophy, and the system of instruction is by recitations and lectures.

This year the other text-books are, Plutarch on the "Delay of the Divinity in Punishing the Wicked," and Cicero "De officiis." The originals, not the translations, of both these works are used. The instructor each day appoints men to prepare a translation of the next lesson, and also reads his own translation of it, thus giving those appointed a key to the substance of the text. At the end of each book he lectures on the general subject on which it has treated. There are no hour examinations, and the cost of books is about five dollars. The title of the course is a sufficient exposition of what it proposes to teach.

Philosophy 5. Mill's "Logic"—*three times a week*—Prof. James. It is not to be supposed that this is to be simply a course in logic. Mill's book lies at the foundation of much of modern philosophic thought, and the book deals with all the great questions of philosophy. Besides the lectures and recitations there will be theses and occasional hour examinations.

In addition to Philosophy 3 and 5, Prof. James will have a graduate course

in psychology, which will serve somewhat as a continuation or enlargement of this year's Philosophy 5, and in which ability to read German easily will be required.

Philosophy 6. (English Philosophy. Locke, Berkeley, Hume. *Three times a week.* Asst.-Prof. Palmer.) This course requires a great deal of time, and is intended for those who wish to make a more special study of Philosophy. The limited field of English sensationalism (Locke, Berkeley and Hume) is taken. A very different method of instruction from that in Philosophy 2 is used, the men being left much more to themselves. At the beginning of each week a certain amount (about 30 pages) from an author is given out, and the work for the week consists in writing a thesis on this, the first half being a summary of the author's arguments, and the second the student's own reflections on them. This, however, is not obligatory, but the theses handed in are marked. During each week lectures are given on the work done by the student during the previous week, and

sometimes the recitation hour is given up to discussion. During the year two hour examinations are held to test the student's familiarity with the text of the authors. The object of the mid-year examinations is substantially the same; most of the questions being those that the students have already discussed in their theses. The final examination, however, is very different. At the beginning of the year fifty topics are given out. Each student is to choose one of these, though during the year he may change if he thinks fit. He is to arrange his ideas on the topic chosen, and to go into the examination at the end of the year without any notes. Here he is to write as systematically and as well as he can, in three hours, a thesis on his subject, the object being to see what he can do under pressure. The aim of the whole course is thus to develop the original power of the students. The cost of text books is about \$5.00.

Philosophy 7. (Earlier French Philosophy. Descartes to Leibnitz, and German Philosophy. Kant to Hegel—*three times a week*—Prof. Bowen.) In this

course Prof. Bowen's "Modern Philosophy" is used as a basis in studying the various philosophers taken up, but this is supplemented during the first half year (when Descartes, Malebranche, Spinoza and Leibnitz are studied) by Bouillier's "Histoire de la Philosophie Cartesienne," and during the second half year by Meiklejohn's translation of Kant's "Critique." More time is devoted to Kant than to any other single author. The method of conducting the course is virtually the same as in Philosophy 1. Prof. Bowen's lectures and comments, especially on Kant, are of great value. The course is a very comprehensive one, giving as complete a view of modern philosophy as is possible in a year's time. Cost of text books about \$8.

Philosophy 8. (Schopenhauer's "Die Welt als Wille und Vorstellung," and Hartmann's "Philosophie des Unbewussten"—*three times a week*—Prof. Bowen.) This course is devoted exclusively to the two authors named, and as there are no translations a knowledge of German is necessary. The method is

less of translation or recitation than of lectures and running comments by Prof. Bowen. The number who take the course is necessarily small, so that the conversational character of recitation is generally pursued. The course is invaluable to the thorough student of philosophy, and Harvard is the only American University that offers such a course. The cost of books is about \$14.

ENGLISH.

English I. English Literature. Chaucer, Bacon, Milton, Dryden. Prof. Francis J. Child. *Three times a week.* This course aims at a careful study of a few well-edited selections from the above mentioned authors. Of Chaucer's works, the prologue to the "Canterbury Tales," "The Knightes Tale," and "The Nonne Prestes Tale," are read, in all about thirty-seven hundred lines. The text book is Morris' selections (cost, \$0.90). Sufficient attention is given to forms, derivation, and metre, to enable the student to read Chaucer easily and intelligently; also the life of Chaucer is briefly discussed. Bacon's essays are read, and familiarity with about one-half of them is required. The text book is Lewis' Bacon (cost, \$1). Of Milton the smaller poems are read, "Paradise Lost and Regained," and "Samson Agonistes" being omitted; possibly a little prose is read. The text book is the Milton of the Clarendon

Press Series (cost, \$1.10). Dryden's "Absalom and Achitophel," "Religio Laici," and "The Hind and the Panther" are read. The text book is selections of Dryden in the Clarendon Press Series (cost, \$0.90). In this course, there are no hour examinations and the regular examinations require a wide and ready knowledge of the work. The lessons are read in the class by members of the section, and the explanations of form and matter given in the notes are asked for. The larger part of the instruction, however, is in the valuable and interesting comments of the instructor explaining the frequent references to history, politics and literature. Some portions of the authors read are to be committed to memory, and there is always a question on this work on the examination papers.

English 2. Shakspeare—Prof. Francis J. Child—*three times a week*. This course gives during the year an opportunity for the careful study of seven or eight of Shakspeare's plays, including several of the most difficult ones. During the year 1881-82 the list will in-

clude "Hamlet," "Winter's Tale," "Othello," "Henry V.," "Merchant of Venice," and "As You Like It." The text-books contain a single play each, and are of small cost. For some plays Rolfe's edition is used, and for others the Clarendon Press edition. There are no hour examinations, and the regular examinations require thorough familiarity with the work. The lessons are read in the class by the members of the section, and the instructor asks for the explanation given in the notes, after which he makes his own explanations and comments. The class is required in the course of the year to commit a few selections to memory, and some knowledge is required of the life of Shakspeare, and of the chronology of his plays as given by Dowden in the Literature Primer on Shakspeare. A few recitations are devoted to the study of the metre used in the plays, but by far the greater portion of the work required is upon the text of the plays. It may be supposed by some that time is given to criticisms of the plays and to the consideration of beauties or apparent defects.

The object of the instructor is, however, to enable the students to obtain, as far as possible, an understanding of the *meaning* of Shakspeare by the study of those words which have changed in form or meaning by the farther development of the language. For the same purpose also much time is devoted to explanations of obscure passages, and of allusions to customs and events of the writer's time. In this the students have the benefit of the instructor's long study of our language in every stage of its development, and by means of his explanations they gain not only an understanding of Shakspeare's allusions, but also a vast amount of information about the age in which he wrote. Only those who have taken this course can realize how much is gained in it by the revelation of innumerable beauties that are hidden from others as effectually as are most of the beauties of Homer from those who have never studied Greek. We are very glad to be able to announce that in future English 2 will be made a two years' course, and that in the two years the section will read fifteen plays, including all of the finest ones.

English 3. Anglo-Saxon—Professor Francis J. Child—*twice a week*. By this course a good Anglo-Saxon vocabulary is obtained. The only text-book is Sweet's Reader (cost, \$1.90), which contains both prose and verse. Among other selections there are extracts from the Old and New Testament, from King Alfred, and from the Saxon Cronicle; and of verse, from "The Battle of Maldon," and from Beowulf. The lessons are translated in the class room by members of the section, and considerable attention is paid to grammatical forms. There are no hour examinations. This course is of great benefit to any one intending to study early English and Chaucer. If three or more students qualified to do so are sufficiently interested to carry the work further, Prof. Child will give Graduate Course 7, Beowulf once a week.

English 4. Early English—Professor Francis J. Child—*twice a week*. The text-book is Mätzner's Altenglische Sprachproben (cost, \$4.40), which contains selections from English poetry of the period between the Norman Conquest

and the time of Chaucer. A knowledge of Anglo-Saxon will be of great benefit. As the notes are in German, that language will also be of assistance, but it is not necessary. The selections deal largely with early English history and with the legends of the period. There are no hour examinations.

English 5. Rhetoric and Themes (advanced course)—*three times a week*—Prof. A. S. Hill. Those who wish to take this course must first consult Prof. Hill, and usually only those Juniors or Seniors are admitted who have done good work in English composition in the preceding year. It may be taken instead of Junior Themes, in which case it counts as a two-hour course. Each man is required to write a theme once in two weeks, and the recitations consist of the reading of the themes by Prof. Hill, and his criticisms upon them. Three books are selected by the instructor to be read before the mid-year, and the mid-year examination consists in writing a theme upon one out of a list of nine or ten subjects connected with these works. The same plan is pursued at the annual,

with three more books. The principal part of the work, however, is on the regular fortnightly themes, which have to be handed back corrected, and sometimes re-written. The course is of great value in giving a man the ability to write fluently and correctly. The subjects are generally chosen by the instructor, but in some cases the men are allowed to choose their own subjects.

English 6. Oral Discussion—*three hours once a fortnight*—Prof. A. S. Hill. This course is open to Seniors only. Prof. Hill selects the subjects for discussion and appoints the speakers from the section in turn, acting himself as presiding officer and critic. As the section is usually of moderate size, each man is chosen disputant four or five times a year, there being six disputants, three affirmatives and three negatives in each debate. It is expected, however, that each man will be familiar with the question discussed at each meeting, and will join in the debate when it is thrown open to the house. Men who do not take the course are invited to attend whenever they choose and to join in the

debate — always allowing members of the section the time which they require. The men who open and close the debate on either side are allowed fifteen minutes each; the other two regular disputants, ten minutes each, and any member of the house, five minutes. Votes are always taken on the merits of the question and of the debate, and the subjects given out are always of general interest. The debate is thrown open to the house after two disputants from each side have spoken. The course is of great value in teaching a man confidence in public speaking, and in rendering him effective in argument. Considerable time must be expended in looking up the subjects for debate, but, as the elective is conducted, perhaps no more time is demanded than should be bestowed on a regular one hour course. There are no examinations.

English 7. Literature of eighteenth and nineteenth centuries—*once a week*—Prof. Hill. This course, in this, its second year, has grown from a small section into a large one, and its popularity will doubtless continue. The period

studied is from Dryden to the present day, or approaching as near the present as time permits. The method of instruction is to appoint an author or a single work of an author to be studied by one man, who is to give the results of his researches to the class by lecturing or reading an essay on the subject on the appointed day. In this way the course happily combines a general knowledge of the whole period with a more particular knowledge of five or six authors that in the course of the year fall to the lot of one man. Besides this, practice in writing, in addressing an audience, and in writing to address an audience, is obtained. Members of the section are not expected to gain their general knowledge of the authors simply from the lectures delivered in the class, but each man is expected to read as much of each author as possible, and Prof. Hill designates certain works which must be read by every man for examination.

MUSIC.

Music 1—Prof. Paine—*twice a week*—text-book, Richter's Manual of Harmony—is intended to give a knowledge of the rules of ordinary four part writing. The work is chiefly a practical application of the theory as set forth by Richter. Exercises are written consisting of a harmonization of short musical themes and of chorals.

Music 2 is a more advanced study of the rules of polyphonic writing, and consists of exercises which employ both the knowledge acquired by a study of harmony and the rules of counterpoint as contained in Richter's Manual of that science. A certain amount of original work is necessary. This course is a direct continuation of Music 1, and is a three hour course.

Music 3 and 4 require no exercises and may be studied independently. A fair knowledge of the piano-forte is required. The former is a study of the development of modern music from the earliest times, and is more historical

than technical. Lectures three times a week.

Music 4 is, perhaps, the most useful to those who want merely an ornamental knowledge of the various modern forms of instrumental music. For those whose study of music is more thorough it is as indispensable as any of the other courses. A knowledge of the piano-forte is necessary. The works of the German composers are studied analytically and their construction discussed. The symphonies and sonatas of Beethoven, Haydn and Mozart form the main subject of study. Lectures once a week.

The work of the two graduate courses is entirely original, and is a more thorough and advanced application of the principles learned in Music 1 and 2. They are each three hours a week.

NATURAL HISTORY.

Natural History. Agricultural Zoölogy—at the Bussey Institution, Graduate 38—*twice a week*—Tuesday and Friday—hours, 12–1.30 P. M. This course comprises lectures by Prof. Slade with occasional recitations and laboratory practice, and instruction in Histology given twice a week in the afternoon during the autumn months by the demonstrator, Mr. Ford. The lectures comprehend a general review of the anatomy and physiology of domestic animals, followed by the special or regional anatomy of those parts most exposed to disease or accident. The pathology, as well as the treatment of diseases, is also elucidated. The laboratory work consists in dissection; the dissecting room is open from 9 A. M. until dusk during the winter, so that men taking this course can devote considerable time to dissection if they desire to do so. The demonstrator is present every afternoon. Material is supplied to students free of charge. The

subjects dissected through the winter are horses, cows, calves, dogs, cats, sheep, goats, hogs and fowls. The aim of the course is to give that amount of knowledge of the anatomy and diseases of domesticated animals which every scientific or practical agriculturist should possess. This course is not only valuable to the farmer but is of primary importance to any man who ever expects to have anything to do with horses or other live stock, for it enables him not only to properly diagnose the diseases or injuries of animals, but it gives him the requisite knowledge necessary to judge as to the soundness, age and general character of the animal he is examining. It also enables him to guard against the impositions and tricks of the horse dealer. It protects him against the ignorance and quack remedies of grooms. And it gives a knowledge necessary to judge as to the best manner of managing stock, as regards air, light, grooming, food, exercise and shoeing. The casual observer may deem these things unimportant, in fact matters of no moment which should be left to the discretion of the groom or

farrier, but they are essential to the health of animals. To illustrate our point we will take as an example shoeing. A proper knowledge of the manner in which a horse should be shod is of the utmost value, and particular attention is paid to it in this course. For most of the lameness of horses, such as laminitis contraction, inflammation of the foot, or acute founder, corns, pricks or wounds in the sole of the foot, etc., can be generally traced either indirectly or directly to improper shoeing; due to the ignorant and barbarous fashion of farriers in cutting the hoof of the horse to pieces and destroying the bars (the bars are the horny ridges which lie between the walls of the hoof and the frog at the posterior portion of the foot) which nature has placed there to protect and preserve the hoof from contracting. In case of disease or accident one is enabled to judge whether the trouble is of a serious or trivial nature. If it be serious he can determine whether it will be worth while to call in skilled assistance or not. As an example we will take the case of an animal falling

and cutting his knee badly. A whitish fluid flows out. The question arises is this fluid synovia (joint oil) or is it merely the rupture of some bursal sac? This can be easily determined by probing the wound. If the ligament proves to be cut through, and the fluid is therefore found to be synovia, the animal had better be killed at once, for even if he did recover, which would be very doubtful, he would henceforth have a stiff knee and would consequently be worthless. On the other hand if the ligament is found not to be cut, the animal, after a rest, would be in good condition again. An ignorant person, or many so-called veterinary surgeons, would have the animal killed at once. This is one of the many instances where a slight knowledge would save a man considerable expense, and shows how important is a knowledge of "applied zoölogy." It must not, however, be supposed from the above that a man who takes this course comes out a veterinary surgeon; far from it, but it does give him a very important knowledge of the diseases, care and general management of our

domestic animals. Students provide their own instruments and books. A case of dissecting instruments is required, which can be bought for \$3. The text-books recommended are Chauveau's "Comparative Anatomy of the Domestic Animals," Williams' "Principles and Practice of Veterinary Medicine," Williams' "Principles and Practice of Veterinary Surgery," Law's "Farmers' Veterinary Adviser."

ITALIAN.

Italian 2. Modern Drama and Essays—Torquato Tasso—Ariosto Reading at sight—Composition—*three times a week*—Asst. Prof. Nash. During the first half of the year 1880-81 in this course particular attention has been paid to the idiomatic phrases and the dialogue of the modern drama. Practice has been given in reading at sight, while exercises in composition have occurred from time to time. An hour examination in composition was held. Since the spring recess one day in every week has been devoted to the practice of idiomatic and conversational Italian. The books are inexpensive.

Italian 3. Boccaccio, Petrarca, Dante—Nannucci's *Manuale della Letteratura del Primo Secolo*—Outline of the History of Italian Literature—Composition—*three times a week*—Asst. Prof. Nash. In this interesting course selections from Boccaccio's *Il Decameron* and from Petrarca's *In rita di Laura*,

and *In morte di Laura*, and from his "Trionfi" were read during the first part of the year 1880-81. An outline of Italian versification was also given. The last half of the year has been devoted to Dante, Italian Literature and composition, and conversation, and the recitations have been occasionally conducted wholly in Italian. In 1881 the *Inferno* was read, and in 1882 the *Purgatorio* will probably be selected; but the plan and connection of the whole *Divina Commedia* is explained every year. Since the spring recess one day in every week has been devoted to composition. The cost of books is moderate.

SPANISH.

Spanish 2. Modern Drama—Cervantes—Reading at sight—Composition—*three times a week*—Asst. Prof. Nash. This course is carried on in precisely the same manner as Italian 2.

Spanish 3. Calderon and Lope de Vega—Early Spanish—Outline of the History of Spanish Literature—Composition—*three times a week*—Asst. Prof. Nash. This is carried on in the same manner as Italian 3.

In all the courses particular attention is given to pronunciation, and a considerable maximum mark is assigned to that subject. Students in all the courses are encouraged to write original compositions in Italian or Spanish. The No. 3 courses are of so advanced a character that the instructor will not admit to them any student whose attainments in the previous courses have not been decidedly high. The courses of next year will be essentially the same as at present, but in all of them more attention will probably be given to conversation in order to make them, as far as possible, practical courses.

MATHEMATICS.

Mathematics 1. Surveying, Spherical Trigonometry with applications to Astronomy and Navigation. *Twice a week.* Asst.-Prof. C. J. White. This course was introduced by Prof. White, and is the only practical course in Mathematics given in the College. In the first half-year the practical applications of Trigonometry to the measurement of heights and distances are taken. In the second half-year Spherical Trigonometry is studied. At each recitation problems are given out to be solved before the next recitation, and the student is required to solve similar problems during the recitation hour. Sufficient explanations are given by the instructor on all the difficult parts of the work, and the course is made interesting to a mathematician. The applications of the subjects show the working of the astronomer and navigator, and free the mind from the prejudice that the higher mathematics have no practical value. The text-books used are inexpensive.

SANSKRIT.

Sanskrit 1. Prof. Lanman — *three times a week*. This course is intended to give a man a thorough acquaintance with the grammar of classical Sanskrit, which differs from the Vedic grammar as Attic Greek differs from Homeric. The first six weeks are spent entirely on the grammar, but after that a short grammar lesson is learned in conjunction with the reading lesson, until the grammar is finished. The reader used is Prof. Lanman's own, and contains five cantos of the story of Nala, which is an episode from the great Indian epic, "Mahabharata;" some twenty-five fables from the "Hitopadeṣa," and a few fairy stories from the "Katha-sarit-sagara." This is all that will be read this year. Next year, however, Mr. Lanman intends to read in addition to the above some selections from the laws of Manu, which are also included in the reader. There are no hour examinations and no semi-annual. The cost

of the grammar (Whitney's) is \$3.50. The reader not being completed, the class reads from texts lent by Mr. Lanman. The course is interesting, and is easier than Freshman German. It is hoped that a large number will take it in future. Prof. Lanman hopes to have the reader with its vocabulary entirely completed by next year. The next course, Sanskrit 2, may be taken by undergraduates who have already taken 1. It is a course devoted to the Vedas. A third course given among the graduate courses counts for honors.

GREEK.

Greek 1—*two hours a week*—Mr. Dyer—Protagoras, Ajax and the Bacchae of Euripides. Greek 1, as it is to be conducted next year, will be an entirely new course, and will not be at all easier than Greek 2. Either Greek 1 or Greek 2 may be counted for honorable mention, but not both. The chief difference between the two courses will be that Greek 1 gives special attention to the literary side of the authors read, and does not offer special training in reading at sight. During the first half year the instructor will give half a dozen lectures on the elementary points in Plato's philosophy. The text-books are Waite's Protagoras, Jebb's Ajax of Sophocles in the series called "Catena Classicorum," and either Sand's or Wecklein's edition of the Bacchae of Euripides.

Greek 4—Greek Composition. Some changes have been made in the plan of this elective, as given earlier in the year. The division will take up the second part of Sidgwick's Greek Prose Composition, and will write, at least, half

an exercise weekly, with illustrations of idioms, and of the structure of sentences mainly from Thucydides, Xenophon and Plato. Occasionally there may be some practice in translating from English into Greek. The exercise in translating at sight from Greek into English, which has belonged hitherto to Greek 4, has been transferred to Greek 2. This course is intended especially for students for second year honors. There will be two divisions, one under Mr. Dyer, and the other, probably, under Mr. Crosswell.

Greek 5 — Mr. Dyer — Sidgwick's Greek Prose Composition, part 3 — written translations from Greek into English. This course is offered only to those who have already taken Greek 4. It is the first year of a two years' training for final honors. The exercises, one a week, will be mainly from Sidgwick, part 3, with illustrations of idioms, and of the structure of sentences, chiefly from Demosthenes, and other orators. Occasionally there may be some practice in translating from English into Greek.

HISTORY.

History 4. Prof. Gurney—*twice a week*. This is a comparatively new course under an old name, the course formerly called History 4 being now History 5, and History 4 being what was called in last year's pamphlet Graduate Course No. 21. This is substantially an introduction to History 5, and to a third course which will probably be added in 1883. The three courses are to form a never ending series, one of which is to be dropped and one resumed each year. They are to cover the whole ground included in the growth of the Roman people, History 4 opening with a series of introductory lectures sketching the formation and gradual solidification of the earliest Greek and Roman governments, continuing with a study of the Roman Commonwealth to the beginning of the Empire, and using Mommsen during its progress as its standard author. No text-book, however, is required in the course. The theory of the course is to

describe and make vivid the institutions and political and social machinery of the Roman people from their earliest existence to the time of Augustus.

History 5. Prof. Gurney — *three hours a week*—formerly History 4, is a continuation of the present History 4, taking up the Roman institutions at the opening of the Empire, and showing the further development of the early municipal forms into a central and now imperial government. No text-book is required in this course either, but Merivale and Gibbon are the best authorities, the students' Gibbon being an excellent book on which to review. The semi-annuals find the class at the reign of Constantine, and the annuals at that of Charlemagne. One delightful feature of this course is the outline given by Prof. Gurney of the rise of Christianity in the Empire.

The third course in this series, which is to be added another year, will probably go hastily over the age of Charlemagne, and beginning at the year 1000 A. D., trace the development of the French people, as far as time will per-

mit, illustrating the recurrence of the tendency towards centralization, and the effect on the new institutions of the previously gained results of Roman civilization. In these courses the instructor during part of the time delivers regular lectures. Occasionally the hour is occupied in answering and asking questions, making the recitation what President Eliot in his report called a conference. There are no regular hour examinations.

GERMAN.

German 1. German plays, stories and essays—advanced grammar—*three times a week*—Asst.-Prof. Cook. This course is conducted strictly by recitations. The students translate the lesson given out, and, if any time remains, read selections at sight. The advanced grammar consists in notes, given during the course of the lesson, on the peculiarities of the text. There are no hour examinations. In the three hour examinations the student is held accountable for everything he has read in the class; only a small part of the paper has thus far been at sight—sometimes none at all. The books for next year are not yet fully determined. It is very probable that they will be Lindan's "Kleine Geschichten" (second hand at about \$1.50), with a play and an essay. Cost of the whole about \$3.

German 6. Goethe, Lessing, Schiller—composition—*three times a week*—Asst.-Prof. Cook. Instead of the above announcement, next year it may possibly

read, Herder, Lessing, Wieland [etc., composition]. But little composition is given, however, and the announcement is left only in order that the instructor may feel at liberty to introduce a few exercises into the course. It is not probable, though, that any will be introduced. Regular lessons are given out and recited, and, if time remains, there is reading at sight. As in the other course there are no hour examinations. The text-books for next year will cost about \$2. Perhaps Wieland's "Oberon" will be read among others. The object of this course is to teach students to read any German they may meet afterwards.

Prof. Cook desires us to add that the marks given in all these courses are generally considered to be a great deal lower than those given by other instructors for equal proficiency. Also, that little or no account is made in marking of industry, attention in class, regularity of attendance, etc., or the opposite, the percentage being assigned according to the amount of knowledge of the subject shown by the examination book.

German 4. Grammar and composition—*once a week*—Asst.-Prof. Cook. The special object of this course is to form an acquaintance with those grammatical peculiarities of German, which are not learned by reading German authors.] The work outside of recitation will occupy about two hours a week. The instructor will give out easy letters of some author, to be translated into German. He will himself supply in class all the unfamiliar words, so as to lessen the outside labour of the students. During the recitation hours, the students will read these exercises, and the instructor will comment upon them. Any time that may remain will be occupied in illustrating grammatical peculiarities in passages read by this instructor. The course will be conducted entirely in German.

HISTORY.

History 8. History of England to the seventeenth century (Constitutional and Legal)—*three times a week*—Dr. Young. This course is most important both for students of general history and also for those who wish to study law. It traces the development of the various branches of the English government from their sources in the purely democratic institutions of the ancient Germans, as described by Cæsar and Tacitus, down to the time when they had assumed forms familiar at the present day. The development among the Franks and Normans on the continent, as well as among the Saxons in England, is studied, and in this way the effect upon England of the Norman Conquest is shown, and some conception is obtained of the origin of many institutions peculiar to England. Almost all English historical and legal writers have been led by national pride to make the early Saxons of England the originators of all of those institutions which made

England for so long the only seat of constitutional liberty. It is, therefore, a peculiar advantage of this course that the student can obtain in it much information as to the origin and spirit of English institutions that he might never obtain in the course of his future reading. Hitherto a part of the time of this course has been devoted to the study of political events, the knowledge of which is essential to the intelligent study of the constitutional history. In future, however, it will be necessary for the student to possess such knowledge of the political history as may be obtained in History 2. In most cases, therefore, this course must be taken either at the same time as History 8 or in some previous year. By this arrangement the main part of the work in History 8 can be devoted to the study of constitutional history alone. The text-book for this course will be Stubb's Select Charters, price about \$2.50. Students are advised to procure also either Taswell-Langmead's or Stubb's Constitutional History. There will probably be one or two hour examinations. A knowledge

of German is not necessary. Matters of private law will hereafter be omitted, as a special graduate course has been established for them. The examinations will be upon the charters, etc., and upon the lectures and collateral reading.

GERMAN.

German 2 and 5. Assist.-Prof. Bartlett—*three times a week*. The first half year is occupied in reading German historical prose, and much attention is given to reading at sight. The latter part of the year is to be devoted during 1881-82 to reading selections from the works of Uhland, Heine, Freitag and Heyse, and other nineteenth century writers, especially prose writers. This is contrary to what has hitherto been the practice in this course, and is designed to render it more directly a preparation for German 5 than it has been in former years. There will probably be no one hour examinations. After the mid-years the course will be conducted mainly in German. Besides the reading at sight, which occupies a large part of almost every recitation, very much attention is given in this course to training the ear, so that men may translate by sound. In almost every recitation the instructor reads from the text-books,

and requires the students to translate without looking on the book. Next year much attention will be given to this and to writing from dictation in order that the men may be prepared for German 5. This course is recommended only to those who have done very well in the Freshman year.

German 5. Prof. Bartlett—*three times a week*. This course is intended especially for students who have already taken German 2, but may be taken by others if they can satisfy the instructor that they are qualified to do so. A few weeks will be given to the study of Luther and his times. Next year, however, by far the greater part of the work will be upon German lyrics and ballads, and upon the lives of lyric writers. A few plays of the writers of the romantic school will be read. The course is to be conducted on the same general principles as the last half year of German 2. It is the design of the instructor to give as much training as possible to the ear, and to give practice in reading at sight. There is no translation into English, the course being conducted entirely

in German. Writing in class from dictation is one of the main features of the recitations, and practice is also given in speaking and writing, by requiring of the students oral and written accounts of the various subjects taken up in the course. Moreover, every student is required occasionally to relate some anecdote in German, and in this way some practice is obtained in colloquial forms. This course forms good preparation for German 7, and also for graduate courses B and C.

MATHEMATICS.

Mathematics 2—Differential and Integral Calculus—*twice a week*. This course, which is distinctly elementary in its character, is intended to give some idea of the methods and scope of this most important branch of mathematics. The principles on which it depends are clearly explained, not merely with reference to their mathematical bearing but in their general connection with physical investigations. Some knowledge of these principles, which are so wide in their application and so different from any learned before, is a most desirable part of education for all interested in science or philosophy. During the year most of the simple formulas are obtained, and their peculiar power and value illustrated by the solution of important problems in physics and geometry.

Mathematics 3—Theory of Equations including determinants—*twice a week*. In this course equations of the third and

fourth degrees are solved, the properties of all equations are studied, and practical methods of solving them obtained. Towards the end of the year determinants are taken up and their use as a means of simplifying the solution of complicated equations of the first and second degrees, is explained and illustrated. It has not yet been decided who is to conduct these two courses next year, but their general character will remain unchanged. The text-books are also uncertain, but in any case the whole ground will be covered in the lectures and the book used only for reference.

Mathematics 4—Analytical Geometry—For students who have taken the Maximum Freshman course in Mathematics—*twice a week*—Professor Byerly. This is a continuation of the course taken by the Maximum Freshman section, and most of the year is devoted to the application of modern methods to analytic geometry. These methods include many of the recent additions to mathematical science, and the most important of them, even down to the present time, are treated in this course.

Some of them are remarkably ingenious, and all who have any taste for this kind of study will find the course extremely interesting. Later in the year the properties of curves of higher degrees than the second are studied by means of similar methods. No text-book is needed, but Salmon's Conic Sections, price \$4.80, will be followed in the main.

Mathematics 5—Differential and Integral Calculus—Second course—*three times a week*—Professor Byerly. This course is a continuation of Mathematics 2, but is much more technical. It will be devoted to a detailed study of the subject of integration, and to the application of the integral calculus and to numerous problems in geometry, physics and the calculus of probabilities. Toward the end of the year an elementary treatment of differential equations will be given. This course is essential for students who intend to become mathematicians and physicists. The text-book used will be Professor Byerly's New Integral Calculus, of which the price will probably be about \$1.50.

Mathematics 9. Analytic Mechanics—*three times a week*—Prof. Byerly. This course will be devoted to the study of problems in mechanics, and will require a good knowledge of the integral calculus. It will follow in the main Walton's Problems in Theoretical Mechanics (price, \$5), and this book, although not essential, will be found very convenient. Toward the end of the year some problems in physics, connected with the propagation of sound and the undulatory theory of light, will probably be taken up. The course is interesting and practical, but not especially easy.

Mathematics 10. Studies in Quaternions and in Analysis—*once a week*—Prof. Peirce. This course is intended especially for candidates for final honors to enable them to study up the subjects on which they write their theses while doing their regular work. Each student will choose some branch of mathematics in which he is especially interested and will devote himself to this. The recitations will consist chiefly of explanations by one or more men of the re-

sults of their work during the preceding three or four weeks, but the instructor will sometimes lecture himself. There is some thought of giving this as a three hour course, in which case the instructor will lecture oftener. As the course has never been given before it is impossible to say with certainty what will be done in it, but the above describes what it is now expected to be. A knowledge of Quaternions will not be necessary as each man can choose his own special subject.

CLASSICS.

Classics 1. Greek and Latin Comparative Philology—*three times a week*—Asst.-Prof. Greenough. This course came only twice a week this year, but will be changed to a three hour course in 1881-82. The special object of this course is to give a sound knowledge of the principles upon which modern etymology is treated. The discussion of particular words is used only as subordinate to this, since the details are more easily filled up in the special study of a single language. The recitation hour is devoted to lectures and special investigations by individuals, with comments on the work done and suggestions in answer to questions. In general the course is adapted to persons who have a defined object and sufficient force of character to pursue it with the assistance of a teacher to remove difficulties. The text books used are Curtius' "Grundzüge der Griechischen Etymologie," and Papillon's "Greek and Latin Inflexions."

There are no hour examinations. In the regular examinations the students are held accountable for the subjects discussed, whether special instruction has been given on a point or not. A wide range of choice, however, is given in the papers to allow more freedom in the study.

About this study Prof. Greenough says: There is a lamentable ignorance and want of sound views in reference to the etymology of words, even among otherwise good scholars, which ought to be removed. Even so excellent a book as Roby's Latin Grammar, for instance, is disfigured by errors in etymology of the most glaring kind. It is a pity that every classical honor student, at least, should not be thoroughly grounded in this branch.

Classics 2—*two hours a week*—Dr. Wheeler. Practice in speaking and writing Latin in connection with the elementary study of some Greek author. Plato's Symposium (Jahn's Ed.) Students will be expected to take turns in preparing a translation and interpretation of passages discussed from week to

week, and the interpretation will be made so far as possible in terms of general conversation. In the course of the year each student will be expected to prepare one or more papers on subjects connected with the literature of Plato, and a considerable part of the marks for the year will be given on these papers. The language of these papers will be Latin, and the recitations also will be conducted in Latin. The course is designed for students who have taken second year honors.

HEBREW.

Hebrew Inflections. Reading from Pentateuch, historical books and Psalms — Davidson's Grammar — *three times a week*—Prof. Toy. This course, open to undergraduates, and required at the Divinity School, begins with a study of the forms and rudiments in the Grammar, but the class begins to read as soon as possible. This year fourteen chapters of Genesis, a number of the Psalms, and considerable portions of the prophets, principally Ezekiel, have been read. The first chapter of Genesis the class are required to learn by heart. The amount read is, therefore, considerable, the study of the Grammar thorough; and Prof. Toy's admirable method makes the course exceedingly interesting. It is probable that this course, with its present excellent management, will in the future attract more undergraduates than have ever been found in the Hebrew class in past years.

PHILOSOPHY.

Philosophy 3. Ethics—Mill's Utilitarianism—Kant's Metaphysic of Ethics—Bradley's Ethical Studies—lectures and theses—Assist.-Prof. Palmer. This course is not intended to take the place of the course in ethics, formerly given by Dr. Peabody. The mental training a man gets is essentially the same as that we have described under Philosophy 5, formerly Philosophy 6. The intention is not to give a general outline of ethics, but to examine minutely into a limited portion of this field. Mill is used for the Utilitarian view of ethics, Kant for the Transcendental, and Bradley for the Hegelian. The books used in the study of the two last are Kant's Metaphysic of Ethics (in Abbot's Ethics), and Bradley's Ethical Studies. Both are difficult in style. Sidgwick's Method of Ethics is also used for reference in connection with the course. Both the examinations and the method of instruction are substantially the same

as described under Philosophy 5, except that the final theses may possibly not be written in the examination room but handed in at the end of the year, a final examination also being given. On the whole the course requires a large amount of time, and is intended for those only who expect to make to some extent a special study of philosophy. Cost of text-books about \$5.

POLITICAL ECONOMY.

No student should allow the four years of his College life to pass without devoting some of his time to the study of Political Economy. It is needless to dilate upon its importance. Aside from the great value of a scientific knowledge of the subjects with which this science deals, the value of the mental training which the study of Political Economy affords can hardly be overestimated. Surely there is no science which investigates causes at once so varied and so important, affecting, as they do, the whole course of public and private life. No citizen of the United States has a right to neglect any opportunity to familiarize himself with the principles regulating, whether we will it or not, the whole social, moral, political and financial development of the country whose future rests partly in his hands.

Political Economy 1 is a course devoted principally to a study of the fundamental principles of the science of Polit-

ical Economy. The text-book used is John Stuart Mill's "Principles of Political Economy," the difficulties in it being cleared up in the recitation room. Just before the* semi-annuals a course of lectures on "Banking" is given by Prof. Dunbar, and before the annuals a course on the "Financial Legislation of the United States," giving special attention to the measures adopted during the war and after it up to the present time. Both of these are full of interest and valuable information. The instruction, if the course is conducted as in previous years, will be given by means both of recitations and of lectures, the latter predominating during the last part of the year, although even then there is enough of delightful uncertainty maintained to prevent the student from slighting the work of each day. As yet no definite arrangement has been made as to the amount of work to be done by each of the two instructors, Prof. Dunbar and Dr. Laughlin. The course will be either two or three hours, as the student may choose. Let no one take it under the impression that he is taking a "soft" course; those

seeking such must avoid Political Economy 1. To recommend such a course to an earnest student would be superfluous; to any other, useless.

Political Economy 2. This course, heretofore known as Political Economy 3, is one that should be taken by every one who has profited by Political Economy 1. As some peculiar ideas as to this course exist throughout the College, the best way to correct them is to tell what the course has dealt with during the past year. The first text-book used is "Some Leading Principles of Political Economy," by J. E. Cairnes. Prof. Cairnes is a pupil and admirer of Mill, but one who dares to oppose his master on points where his reasoning or his conclusion seems faulty. He goes deeper into some of the principles of the science than Mill could possibly go in writing such a work as his "Principles," and his book is perhaps a needed corrective to the mind of one too fully charged with Mill. The "Essays in Finance" is a collection of essays on economical and financial questions of the present time, by Robert Giffen, a gentleman in the

employ of the London Board of Trade, a statistician, a member of the Statistical Society, and a contributor to the *Economist*. These essays bring the student face to face with the practical side of Political Economy. Prof. Dunbar has also given a course of lectures on the "History of Political Economy," tracing the various distinguished economists of England, France, Germany, Italy and Russia; he has also lectured on other economical subjects. The class has also studied the question of the "Gold Standard," and undertaken a slight analysis of some recent pamphlets on "Free Trade" and "Protection." Each student is required to write a thesis on some subject connected with Political Economy. The subjects of this year were: "The Decline of American Shipping;" "The Act of May 31, 1878," and "The Balance of Trade since 1873 and its Probable Future." The course is eminently a practical and working course on Political Economy, which no one who wishes thoroughly to understand that science can safely neglect. It might well be called a course

in "Applied Political Economy," as in it the principles learned in Political Economy 1 are studied in their application to actual events. Any one wishing to take the course must first consult Prof. Dunbar. Whatever may be Prof. Dunbar's private opinion on the, to us, vital questions of free trade and protection, the treatment which they receive in the class is absolutely impartial, and neither side can complain that it is misrepresented.

PHYSICS.

Physics I. Astronomy — Optics — Acoustics — *Twice a week* — [Can be taken three times]—Prof. Lovering. The first two-thirds of the year is occupied by recitations, and lectures from time to time, on Herschel's *Outlines of Astronomy*. The nature of the elementary geometrical conceptions relating to the globe of the earth and to the celestial sphere, are first taken up, and are followed by accounts of the various astronomical instruments used in observation. A complete view of the geography of the earth succeeds, including the process of determining latitude and longitude, of making maps, etc. By this time the student is prepared to begin the astronomy of the heavens and uranography, including the nature of refractions, parrallax, etc. Then follows a study of the sun's apparent motion and its physical constitution, a study of the moon's real motion and its physical constitution, including

an explanation of solar and lunar eclipses. The movements of the planets and the controlling laws of these now are examined with a view to the study of transits. Later on in the course a careful and interesting study of comets, and a hurried examination of the fixed and periodic stars is made. The course requires only elementary mathematics and there are few mathematical demonstrations. Optics [or Acoustics] is given *twice a week* the rest of the year, and the text-book used is Part IV of Deschanel's Elementary Treatise on Natural Philosophy. This course of Optics takes up the propagation of light, the reflection and refraction of light, with interesting and explanatory experiments on the lecture table, followed by an investigation into the nature and uses of lenses, and a study of the human vision and of optical instruments, ending with an examination of the spectra and the nature of color. Little mathematics is needed for this part of the course.

The third hour of the course is devoted to the subject of heat, and the text

book is the II Part of Deschanel's Natural Philosophy. All the phenomena of heat are explained, and to the practical parts of the subject most attention is given. In this part only of the Elective are there hour examinations, and these take the place of the final examination. The year's mark is determined by the recitations as well as by the examinations.

Physics 2. *Three times a week*—Prof. Trowbridge. Practical exercises in the laboratory, including the use of instruments of precision in testing the laws of mechanics, acoustics, optics, magnetism and electricity; and an extended course in electrical measurements. This is an elementary course in practical physics to be taken either as an introduction to a thorough study of the subject, or by itself as their only course in Physics by those who wish to gain some knowledge of the methods of investigation used in this branch of science, without devoting too much time to it. The instruction is alternately given by means of lectures and laboratory work, three hours of lectures one week

and six hours of laboratory work the next. Each man may arrange his laboratory hours to suit himself, but not less than two hours must be taken at once. During the first half-year students are expected to acquire some facility in using the most important pieces of apparatus, and for this purpose they perform various simple experiments. The lectures comprise explanations of these with a general view of the subject which they illustrate. The semi-annual is a laboratory examination to test the students' skill in the use of apparatus. The men come in at their regular hours and are required to repeat two or three of the experiments given out during the half year; they then write a description of these, and on these descriptions, and the impressions which the instructor has obtained from their laboratory note books, and their general work, the semi-annual marks are based. After the mid-year the instructor assigns to each man a subject which he is to work up thoroughly during the half year, and on which he is to prepare a thesis; he also as-

signs to each another subject on which he is to lecture to the class. Each has to lecture thus once during the half year. There is another laboratory examination at the end of the year. The instructor's object is to enable each man to get a thorough understanding of one or two subjects by investigating them himself rather than a more superficial knowledge covering the whole field.

Physics 3. The Conservation of Energy—recitations and lectures—*twice a week*—Prof. Trowbridge. This is a course of theoretical physics. The text-book for the first month is Balfour Stewart's Conservation of Energy (price, \$1.20), but the recitations are largely from reference books, which are reserved in the library. Lectures are given from time to time by the instructor, with experiments illustrating the points taken up. All the principal writers on the Conservation of Energy are studied in the course of the year.

Physics 4. Undulatory Theory of Light—Electricity and Magnetism—*three times a week*—Prof. Lovering. The first half year is devoted to electricity

and magnetism. The course is conducted on the recitation system, and lessons assigned each day. The recitations are illustrated by experiments performed by the instructor. The second half year is occupied with the study of light, and is conducted largely by lectures. This part of the course is intended more for those who intend to specialize in physics, than for those who want merely a general knowledge. All the principal phenomena of light are studied. A knowledge of analytical geometry is essential and some knowledge of the differential calculus will be found useful.

Physics 5. The spectroscope and its applications—Thermodynamics and Thermics, including the applications of heat—*three times a week*—Prof. Gibbs. The special object of this course is the encouragement of original scientific research, and for this purpose the instructor will meet the students in the laboratory at any time and direct them in their work. This year three lectures are delivered weekly and the marks are given on the final and mid-year examinations, but, if the students prefer, one recita-

tion will be held a week, and marks will be given for it. Beside these the students are expected to spend as much time in the laboratory as their engagements will allow. For the first two months the lectures are devoted to explanations of the spectroscope, which are chiefly experimental, but partly mathematical. After this, lectures are given on the experimental part of the subject of heat, and towards the end of the year on thermodynamics or the mathematical theory of heat. A good knowledge of the Calculus is necessary in this course. No text-book is used.

LATIN.

Latin 1. Terence (Phormio, with selections from other plays)—Cicero (Letters), also Tacitus (Agricola)—Horace (Satires and Epistles)—translations at sight—*three times a week*—Assist.-Prof. Smith. The object of this course is to continue the training of those who are interested in Latin and wish to continue the study beyond the Freshman year. A variety of methods is employed, partly determined by the subject, partly with a view to keep up the interest of the student. The best idea of this course can be conveyed by giving an account of the course as it was in 1880-81. The first few weeks were given up to lectures, in which the whole of the Phormio was expounded as an introduction to the study of Terence. An hour examination was then held, the only one of the year. Then two hours a week were occupied in taking up parts of Terence and reading mostly at sight. The third hour was

given to recitations in Cicero's letters. In the second half year two hours a week were given to recitations in Horace's Satires and Epistles; the third hour to lectures on the *Agricola*. There is always some translation at sight to be done in the mid-year and final examinations. Cost of text-books insignificant.

Latin 2—Cicero, Terence, Horace's Satires—*twice a week*—Assistant Prof. Greenough. This course, together with Latin 3 (composition) is intended especially for members of advanced divisions in the Freshman year, to prepare them for second year honors. It covers nearly the same ground as Latin 1, but more grammatical knowledge, on the part of the students, is presumed at the outset. The instruction in the first half year is in reading at sight, for the purpose of giving a greater command of language than has been obtained in the Freshman year, with a bolder and freer style of translation. In the last half year the same object is partly pursued, but more attention is paid to the connection of thought and allusions. Lessons are as-

signed, but there are no recitations in the ordinary sense. At the beginning of each exercise students are expected to ask questions on difficult points, and the instructor then translates the lesson in a free style with running comments. The remainder of the hour is occupied with instructions in reading at sight. There are occasionally hour examinations for practice, but marks are assigned only on the mid-year and final. The text-books used are inexpensive, as German editions can be procured.

Latin 3, 7 and 9. Latin composition—*each one hour a week*—3 under Assistant-Professor Smith—These three electives form one continuous course and are intended to prepare men for the honor examinations. The second is open only to those who have taken the first, and the third to those who have taken the second. The first, Latin 3, is intended to prepare men for second year honors, and the instruction in it is given during the first half year by easy conversation and writing in Latin, Cæsar's Gallic War being the text-book. One or two chapters are

given out to be prepared before each lesson, and the instructor asks questions upon the subject matter of this text, the entire conversation being carried on in Latin. This occupies about half of the recitation hour. During the rest of the hour the students write a short composition on some subject assigned by the instructor, the subject being such that the text studied will supply the student with facts and words, but the phrases and sentences must be his own. In this way the students learn to use the language in all its variations of tense, number and person. In the second half year a regular composition book is used, and exercises are previously prepared. The marks are assigned for recitations and examinations. The second course, Latin 7, is conducted like the second half year of Latin 3, except that, the number of students being small, each one is able to get much more personal instruction. In the third and final course, however, the instruction is to individuals, not to the class all at once. The professor goes over each man's paper with him alone, which is a great advantage. Exercises

to be written in Latin are of course assigned. There are no hour examinations in any of these courses.

Latin 4. Latin Poetical Literature—*twice a week*—Asst. Prof. Smith. For a man who is really interested in the study of the Latin language, this is perhaps the most enjoyable course at present offered by the College. There is to be obtained from it really useful knowledge in a very agreeable way. The period covered extends from the earliest time to the end of the silver age. Of course, when there is so much ground to be gone over, there are many poets necessarily dismissed with but passing mention, but of all those with whom a literary man would wish a closer acquaintance, the lives and poems are pretty thoroughly studied. Ennius, Lucretius, Catullus, Tibullus, Propertius, Lucan, Statius and Martial, together with some of our more familiar friends, are introduced to our consideration and admiration. The text-book used is Thackeray's "Anthology" (a collection of poetical extracts); its cost is \$1.60. The conduct of the elective is

as follows: Lectures on the life of each poet as he comes up; lessons assigned in the book of extracts; at the beginning of each exercise an opportunity given to the students to ask questions; then the whole lesson translated by the instructor; no recitations by students; no hour examinations. The course, though attractive, is by no means what is generally known as "soft."

Latin 5—Latin Prose Literature—Cicero (Venine Orations)—Cæsar (Civil War), Suetonius—*three times a week*—Assistant Prof. Greenough. Latin 5 is a new course, intended for students who do not care to attain what is called exact scholarship, or who wish to read a great deal of Latin. The language will be treated as a living means of communicating ideas, and less attention will be paid to translation than to extensive reading in the original. The continued and increasing popularity of Greek 3 has shown how much this kind of instruction in the classics is needed, and many will be glad to have an opportunity of taking a similar course in Latin. Courses like this help to show men that

by the hard work which they do in getting grounded in the classics, they open for themselves a new field of enjoyments, and it will certainly have the effect of increasing the number of those who keep up their Latin from a love of literature. The ordinary German editions of the authors read will be the only text-books required.

Latin 6—*three times a week*—Prof. Lane. The authors read in this course vary from year to year, although they are usually in part at least selected from the following: Tacitus, Suetonius, Pliny, Juvenal. The method of instruction is by recitation. A fixed amount is given for each lesson, and this is translated in the class by the members of the section. Occasionally Prof. Lane translates himself. There is some reading at sight besides, and considerable practice in reading and pronouncing Latin. Prof. Lane's comments on the text are valuable and cover a large field; a large part of them relate to the form of words, their spelling, the quantity of the syllables, and derivation. The class has the benefit of some of the profes-

sor's investigations in the preparation of the coming Latin Grammar. The textbooks are inexpensive—generally German texts. There are no hour examinations, and regularity in the work of recitations is considered of as much importance as excellence in examinations. Besides passages from the works read, the examination papers usually have some Latin at sight, and questions on the comments made in class.

Latin 8—*three times a week*—Prof. Lane. The method of instruction in this course is identical with that in Latin 5, indeed seven may be considered a continuation of that course. There is the same freedom in regard to authors, but the following is the list usually chosen from: Cicero, Lucretius, Plautus, Catullus.

MATHEMATICS.

Mathematics 6. Analytic Mechanics, with an introduction to Quaternions—*three times a week*—Prof. Pierce. This course is intended to be taken as a two year course, but it is expected that men who do not care to spend another year on it will take it for the sake of being thoroughly grounded in the elements of the subject. Analytic Mechanics is especially suited for treatment by the calculus of quaternions, and those who take this course will have the advantage of being able as soon as they have mastered the elementary principles of this calculus to use them in the solution of problems which would be more difficult to solve by any other method. Those who have taken a number of courses in pure mathematics, and are desirous to apply their knowledge to practical problems, will find that a course in Analytic Mechanics opens the widest, and most interesting field for their application. This course will differ from Mathematics

9 in devoting more time next year to a somewhat detailed study of the ground work of the subject. Clifford's Elements of Dynamics (price, \$1.90) and Kerr's Rational Mechanics will be used as text-books.

Mathematics 7. Descriptive Geometry and Perspective — *three times a week*—Prof. Eustis. Only the most elementary knowledge of mathematics is required in this course, but a peculiar kind of imagination, namely, the power of picturing to one's self figures in space, is needed, and this faculty will be greatly developed by the year's work. During the first few months the properties of curves and surfaces in space are studied by means of their projections on two perpendicular planes, as a knowledge of the principles of these projections is the basis of a thorough understanding of all mechanical and perspective drawing. Later in the year shades and shadows and perspective will be studied. Finally the section takes up stereotomy, or the art of cutting solid bodies into specified forms by means of diagrams cut out of card board in such

shapes that when the body has been properly cut the diagram will fold round it and exactly fit it. The text-book used will be Church's Descriptive Geometry (price, \$3.50). Lessons will be assigned in this and recited, and at the end of the recitation the instructor will give explanations and information connected with the lesson. This course is necessary for all who, as engineers or inventors, may have occasion to make drawings of machinery, and it will be found very useful by all who wish to do any drawing or painting, as it will show them the rationale of the common rules of perspective, and enable them to make their own rules in peculiar or exceptional cases.

ROMAN LAW.

Roman Law 1—*three times a week*—
Dr. Young. The course aims to teach the elements of the Roman Law, and is to be recommended to all those intending to adopt law as a profession. The Roman Law is important because it is the foundation of all law, except in English speaking countries, for today a large part of Europe is ruled by codes based on it. The English have developed a system side by side with the Roman, and now of equal importance, which, however, has been greatly influenced by the Roman system. The course is valuable also from the stand point of philology and history, as many of our institutions and customs are directly traceable to the Romans. The institutes of Gaius and Justinian are studied, omitting, however, the law of inheritance. The text-book is followed closely, and a working knowledge of Latin is necessary. A knowledge of German also is desirable, but not necessary, as

the best commentaries on the Roman Law are in German. The text is commented upon and the difficulties carefully and interestingly explained; the instruction is given, however, mostly by lectures. No theses are required from the student, but cases may be given out with references to the digest, which must be carefully worked up and the decisions presented to the instructor. The examinations cover the Institutes, comments and lectures; hour examinations may be given, and for various reasons are desirable. The text-book used is Justiniani et Gaii Institutionum Syntagma, Rudolphus Gneist, edidit, 1880. Cost about \$2.

Roman Law 2—Prof. Gurney—*once a week*. The course in Roman Law, under Dr. Young, being so extensive as to necessitate the omission of some portion of its field, this additional course on the Roman Law of inheritance has been assumed by Prof. Gurney. It will be found of great practical value to those who have already taken Roman Law, or to students of English Law, and of interest to any who intend in future to make the study of law or Roman history a specialty.

FRENCH.

French 5. Translation and reading at sight—Mr. Bendelari. This course has been changed from a historical course to one in literature. It is intended for those men who, after having taken French 1, wish to take only one more elective in French. It may also be taken at the same time with French 2, and in special cases may be taken by those who have had only admission French. The books read will probably be Gautier's *Capitani Fracasse*, Victor Hugo's *Notre Dame de Paris*; Balzac, *La Recherche de l'Absolu*; Cherbuliez, *Comte Kostia*. The section will also read some of the writings of Taine and of Ste. Beuve, and will take up some modern French poetry. Certain books will be assigned to individual students to be read in addition to the regular work. The French read in this elective will be difficult. The lessons at the beginning will cover from twenty to thirty pages. From two to three thou-

sand pages will be read in the course of the year. This course is intended especially to give the student facility in translating and reading at sight, and after the first part of the year this will form the chief part of the work in class, while much will be read outside. Any one wishing to take this course must first consult the instructor.

Graduate Courses. Modern Languages D, old French—Mr. Bendelari. This is either a two or a three hour course. The work will be mainly philological, showing the derivation of the French from the Latin. Nevertheless a large amount of old French will be read, enough to enable men at the end of the year to read old French at sight. The work in class is so arranged as to accomplish both these objects. Only those who have done well in the higher French courses will be admitted. No one will be admitted to the course after the first of July, as the books must be ordered a long time beforehand.

GERMAN.

German 3. German Scientific Prose—*twice a week*—Mr. Hodges. This course counts as a one hour elective for those who have had a course in German previously. The books used are Helmholtz's "Wissenschaftliche Vorträge" and "A Course in Scientific German," by H. B. Hodges. The recitations for the first part of the year are translations of set lessons, and for the second half year translations at sight, but the recitations are not marked. The lessons are of moderate length, and the German is not hard when familiarity with the technical terms has been gained. Practice in understanding spoken German is also obtained in the class room. It is Mr. Hodges' belief that it is useless for students to try to learn to speak German in the class room, but he does believe that men can learn to understand the language when heard, and so prepare themselves for lectures in the German universities. To accomplish this pur-

pose several object lessons are given in the course of the year. There are generally two hour examinations, and the papers at all the examinations consist of passages that have been read, passages at sight, and questions on Mr. Hodges' explanations in the class room. The course is of great value to those who intend to pursue scientific studies, as it gives an opening to the immense field of German scientific literature.

German 7 — Prof. Bartlett — *three hours a week*. We take the liberty of copying from the *Register* for June, 1880: "This elective takes up the masterpieces of the so-called second classic period (1750-1825), with the examination of the lives of Gœthe, Lessing and Schiller, and some of the minor writers of the time. Each student is obliged to make special and exhaustive study of some part of the work of the course, and to lecture to the class on that part. A tragedy of Schiller, for example, is assigned to a student. When the class reads this tragedy, the student, who has had some weeks to prepare his work, gives in a preliminary lecture an ac-

count of the conception of the work in the mind of the author, details as to the time and place where it was written, the first performance, and other kindred matters of interest and importance. If the plot be founded on history, the historical incidents are dwelt upon, the author's deviation from truth, and portrayal of characters are pointed out. The student also furnishes notes upon the difficult points in the text, and after the class has finished reading it, gives a summary of the comments upon it, drawn from the chief German, English and American authorities. After reading these criticisms the student gives his own opinions upon the disputed points, and the whole class takes part in the discussion." Next year special attention will be given to Schiller.

FINE ARTS.

Fine Arts 1. Principles of delineation, color and chiaroscuro—Ruskin—Viollet le Duc—Pyne's perspective—*twice a week*—Mr. Moore. Fine Arts 2. Principles of design in painting, sculpture and architecture—Ruskin—Sir Joshua Reynolds—Woltmann's History of Painting—*twice a week*—Mr. Moore. In these two courses there is the same end in view, and the same method of instruction is used. Course 1 is introductory to Course 2, and a student must have passed satisfactorily in the former as a preparation for the latter. One lecture a week is given, and besides there are two hours of free hand drawing in the recitation room. The aim of this drawing is that the student may learn to see and to apprehend art as language. Though the drawing is thus used primarily as a means of apprehending the principles of the course, it is still an excellent preparation for any work of the kind a man may wish to take up after-

wards. So much of the history of art is given as bears on the principles of design. Those who take the course are expected to spend four hours a week outside of the recitation room in studying the text-books and in drawing. This, with the lectures and recitations, six hours a week in all, would be a fair amount of work for these courses, though those more particularly interested would give much more. The examinations are on the lectures and text-book. Besides the two regular examinations, oral hour examinations are held from time to time. Cost of text-books for Course 1 about \$10; for Course 2 somewhat more. Drawing material for Course 1 amounts to about \$10; the same materials will do for Course 2.

Fine Arts 3. Ancient Art—Reber's *Kunstgeschichte des Alterthums*—*three times a week*—Prof. Norton. This course is wholly a lecture course. The lectures are very interesting and important, and to derive benefit from the course it is necessary to pay them close attention. The work to be done outside

consists in reading the portions of Von Reber's book designated by Prof. Norton, and the class is examined on these. Besides this required reading, many references are given to books of great value to the student in connection with the course, and a large field of parallel reading is thus opened. There are no hour examinations, and the text-book costs about \$3. The great value of Prof. Norton's lectures gives the course its deserved popularity. It is not a hard course to get through, but it is a hard course to attain great excellence in. The course is not so much a course in æsthetics as a course in history. The history and philosophy of the age and the people that lived in it are studied—but from the artistic standpoint. This is a fact not always recognized by those who propose taking Prof. Norton's courses. Von Reber's book is being translated by Mr. Joseph T. Clark, the leader of the Assos expedition, with the revision of Prof. Ware of the Boston School of Technology. This translation will probably be ready next fall, and at any rate some time in the course of the year.

Fine Arts 6. Romanesque and Gothic Art, from the year 1000 to 1350—*once a week*—Prof. Norton. This course is conducted upon much the same principle as Fine Arts 3, except that there is no text-book required. There are several works to which Prof. Norton refers, and which students are advised to read if they desire a thorough knowledge of the ground covered. The book most especially recommended is Schnaase's "History of Fine Arts," the volume devoted to this period. Of this there is no translation, but it is much the best book for a general view of the subject. Here, as in the other course, the historical importance of the study must be borne in mind. The lectures cover a period of great interest, and might well be supplemented by a more purely historical course of reading, such as would be afforded by Dr. Emerton's elective. The comparison and contrast, and the gradual growth from one into the other of the Romanesque and Gothic styles of architecture, is most interestingly worked out, and several famous cathedrals and churches are most carefully studied—

as St. Mark's, the Duomo at Florence, the cathedrals at Pisa and Sienna, and the great cathedral at Chartres. An idea of the interesting character of these lectures can be obtained by reading Prof. Norton's book, published last Autumn, entitled "Church Building in the Middle Ages."

GREEK.

Greek 2. The lectures on Greek Etymology have been transferred to the Freshman year, where they will be given to the advanced section. The first half-year will be given to Thucydides; the second to Aristophanes. The instruction in this elective, especially during the first half-year, will be devoted more particularly than heretofore to the preparation of students who are candidates for second year honors, for their sight examinations in May. There will be a critical examination at the mid-years on selections from the two books of Thucydides named, equal in amount to five pages of the text a week for a half-year. This part of the course is given by lectures. Besides this, there will be daily practice in translation at sight. Part of the practice will be in writing, and is designed to take the place of the translation from Greek into English previously done in Greek 4. The two plays of Aristophanes together

contain 3000 verses. The instructor's comments will include, in addition to a running comment on the text, an elementary explanation of the metres and an exposition of manners and customs. The plays are the *Birds* and *Acharnians*. A good idea can be got of the subject of these, and of the fun in them, from Treve's translations of extracts in the third volume of his works.

Greek 6. Greek Composition (third course). Sidgwick's *Greek Prose Composition*, Part 4; written translations from Greek into English—*once a week*—Asst.-Prof. J. W. White. Course 6 is the final composition course in the series designed for honor candidates. The work consists mainly of written exercises from English and Greek in the style of Plato. The instructor meets each member of the elective separately, and criticises and discusses with him his translation, which has previously been corrected, and put into his hands together with a translation made by the instructor himself, or by some third person. The work thus has the advantage of complete revision by the instructor.

The Platonic exercises in the last part of Sidgwick are first written, and afterwards translations from Plato are given out to be turned back into Greek. No text-books are required, except those which the student has already used in College. The course is open to those only who have taken Greek 5.

Greek 7. Demosthenes (De Falsa Legatione and De Corona, with parts of Aeschines against Ctesiphon), Thucydides (parts of Books I and II), lectures on the political history and antiquities of Athens—*three times a week*—Prof. Goodwin and Asst.-Prof. J. W. White. This course is intended to enable men to read the more difficult prose authors and to give them an understanding of Athenian history at these important periods. The course is conducted on the lecture system, the instructor reading in the class the amount of matter which the student must have prepared beforehand. Part of the hour is devoted to answering questions on previous work. The cost of the text-books need not exceed \$5. The amount read is about three and a half pages daily in connection with Grote.

Greek 8. Plato (Republic), Aristotle (Ethics. Books I, IV and X)—*three times a week*—Prof. Goodwin. In this course particular attention is given to the subject matter of the authors read. The same system is pursued as in Greek 7, and there are occasional lectures on philosophical questions connected with Plato and Aristotle. The course may be substituted for a course in Philosophy by candidates for honors in that department, and is also important for candidates for final honors in Classics. The cost of books need not exceed \$3.

Greek 9. Aeschylus (Seven against Thebes and Eumenides), Sophocles (Œdipus at Colonus), Aristophanes (Knights), Pindar (selections)—*three times a week*—Prof. Goodwin. This course is intended for those who wish to read rapidly, and have attained some facility in reading. The lecture system is used in this course also. The amount read is about one hundred lines a day, and it is particularly necessary for the student to read the work carefully before the recitation. Other works of the

Greek poets will be read in this course in 1882-83, and the course can be taken in two successive years. The cost of the books varies between \$4 and \$15, according to the editions purchased.

Greek 10. Arrian (Anabasis) — Polybius (selections)—*twice a week*—Prof. Sophocles. The first of these authors taken up, Arvan, occupies the time up to the mid-years. In the Anabasis is given a very interesting history of Alexander, and of his marches. The time from the mid-years to the annuals is occupied with selections from Polybius, in which are accounts of Hannibal, and of his battles. In this course all accounts of trivial matters are passed by, and the student's work is confined to important battles and other matters of historical interest. Much Greek is not read, but particular attention is given to accuracy of translation, and to a critical examination of all words. The works of these authors should not be classed, as they sometimes are, among the writings of the Byzantine period, but rather among the writings of what might be called the Iron Age of Attic

literature. The Greek is purely Attic. The greatest benefit of this course is not derived directly from the text but from the instructor himself. Prof. Sophocles enlivens the course with comparisons between the ancient and modern Greeks, and between ancient and modern heroes. The instructor has an inexhaustible supply of anecdotes relating to the work gone over, and his dry humor makes the recitations doubly interesting. The textbooks of this course cost about \$3.50.

Greek 11. The private life of the Greeks, a course of illustrated lectures on the manners and customs of the ancient Athenians; but with occasional references to the other races and to the Homeric times—*one hour a week throughout the year*. Intended mainly for Juniors and Seniors. The instructor's plan is to give in a simple and elementary way, but systematically, a picture of how the ancient Athenians lived. He will describe, for example, their houses and how these were furnished; what they ate and drank, and how this was served; their dress, shoes and personal ornaments, and their care of the hair

and beard; their system of education; their marriage and funeral rites, entertainments, in-door and out-door sports, markets, shops, exports and imports; the trades and professions among them; their country life; their means of conveyance; the ship, and how it was manned and rigged; the horse, and how he was bridled and harnessed; their slaves, etc., etc. The lectures will be illustrated as fully as possible by means of diagrams, casts of works of ancient art, books on art and the magic lantern. The instructor believes that this course had better not be taken before the student's Junior year.

ITALIAN.

Italian 1. De Amicis (La Vita Militare) — Goldini (Il Bugiardo) — Mangoni (I Promessi Sposi)—Silvio Pellico (Le Mie Prigioni)—Toscani's Grammar — Prose composition—*three times a week*—Mr. Bendelari. The method of instruction pursued is that of recitations and written exercises. During the first half year Toscani's Grammar is carefully and exhaustively gone through, including all the exercises to be written. This gives a complete review of the whole science of the language. A portion of La Vita Militare is translated from Italian into English. After the mid-years, a part of I Promessi Sposi and Il Bugiardo are read to give an acquaintance with the commoner idioms. During the last half year the regular exercise in prose composition is the re-translation into Italian of the English translation of Le Mie Prigioni. One hour examination in pronunciation is held. The object of the course is to give as much ability in reading and writing Italian as is of use in ordinary life. The method taken is eminently calculated to equal in its results the most sanguine expectations.

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